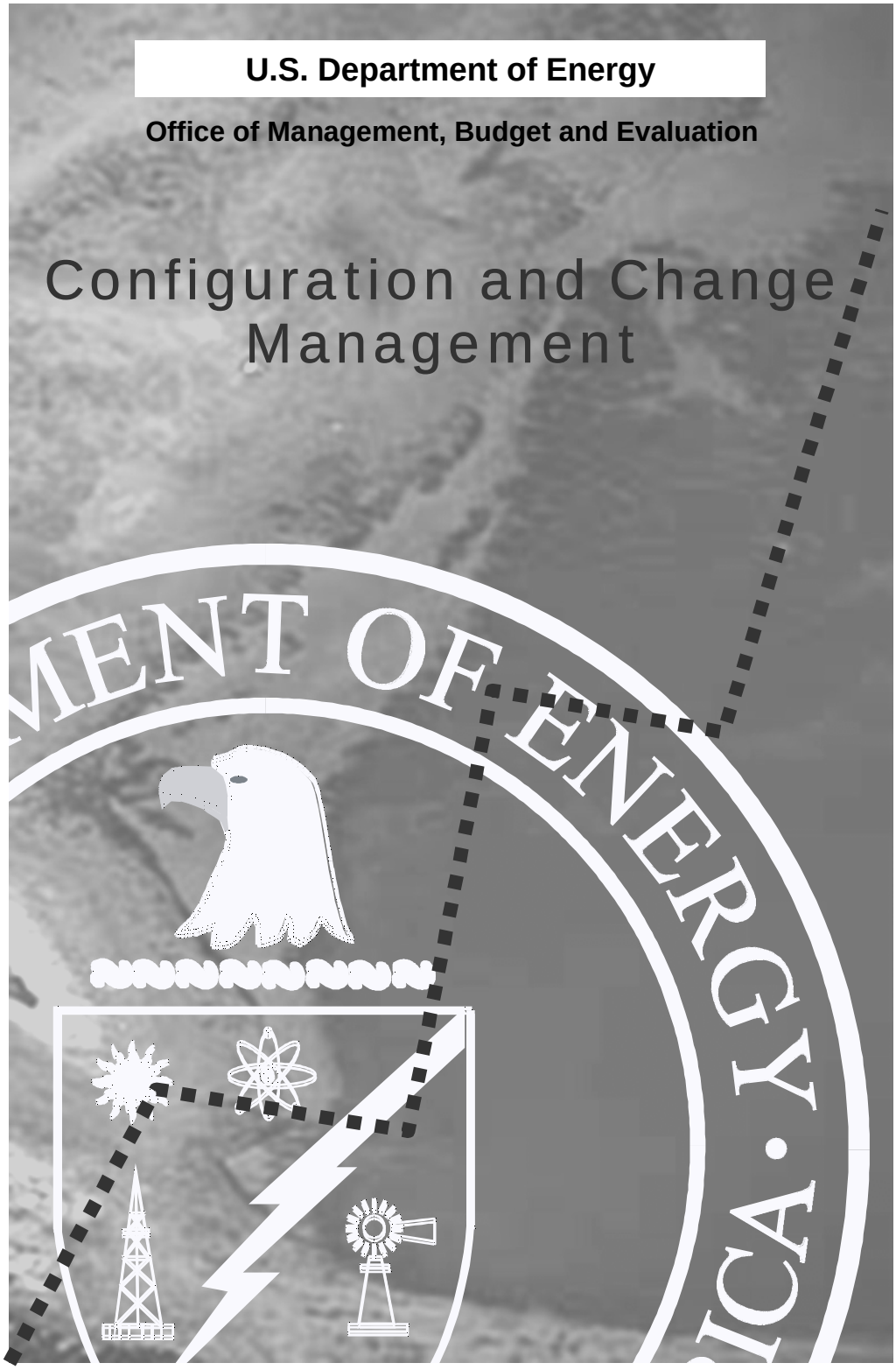
U.S. Department of Energy

Office of Management, Budget and Evaluation

Configuration and Change Management



Initiated by: Office of Engineering and Construction Management

CONFIGURATION AND CHANGE MANAGEMENT

1.0 OVERVIEW

Successful accomplishment of a project requires that all participants be provided continuous, accurate project information, including its end product(s) and deliverables. As a project proceeds through its life cycle, the number of participants grows significantly and the volume of information grows exponentially. The task of managing this information is a major challenge, but is essential to project success.

During the early stages of a project's life cycle, the end product(s) are defined by functions and requirements contained in mission need and conceptual design documentation. The number of participants is small and managing information is relatively easy. The focus at this time is on identifying and controlling changes to the functions and requirements and ensuring rapid dissemination of changes to all participants. This is most effectively accomplished by controlling revisions to and distribution of the documentation containing the requirements.

As a project progresses, functions and requirements are expanded into design requirements that identify and define the functional and physical configuration of the end product(s). These design requirements, in turn, are expanded into the detail required to construct, operate, and maintain the end product(s). During this same time period, the number of project participants also expands to include designers, constructors, and operators who often represent different organizations. The task of information management now becomes complex. The increased volume of information, number of documents, and requests for changes all contribute to the complexity. The key processes in managing this information include data identification, document control, change control, and data management.

- *Data Identification*. Includes selection of structures, systems, and components of the end product(s) subject to control, and identification (or development) and selection of the documents that define both the products and the structures, systems, and components.
- *Document Control*. Identifies, reproduces, distributes, files, controls, tracks status, retrieves, manages, and dispositions project documents.
- *Change Control*. Provides a documented, systematic, and controlled method for managing project changes and the project's physical and functional configuration to ensure all changes are properly identified, assessed/evaluated, reviewed, dispositioned, and (when appropriate) implemented, tested, and documented.

- *Data Management*. Ensures necessary project information (including its end products/deliverables) is systematically recorded and disseminated for decision-makers, and that only the latest approved documents are being used on the project.

Collectively, the integration of these elements among all participants is referred to as configuration management. Figure 1illustrates the relationship of these elements to the project's life cycle. As shown in this figure, elements of configuration management are applicable through all phases of a project.

Configuration management helps ensure an orderly process for the control of changes to project baseline products as they evolve through each project phase. Project configuration may be verified at any stage of the process to enable management decisions to be based on current information. Proposed changes may be better evaluated for impacts, data retrieval is faster, and project personnel are more confident in that data -- enabling faster, more cost-effective project control practices. Historical data would be more readily available, which would result in more accurate estimates of the status of the current project as well as assisting other projects that may use the data.

Activities that constitute the configuration management discipline include:

- Planning and Management
- Configuration Identification
- Change Management
- Status Accounting
- Audit

Configuration management controls should be applied using a tailored approach based on the needs of the project: health, safety, environmental, cost and programmatic importance of the components, systems, structures, and products.

Implementation of configuration management guidelines should be based on the use of existing procedures, policies, programs, and processes. When practical, configuration management activities should be included as steps in related activities rather than standalone procedures to help ensure the steps are integral to the process(es).

Change management is the process of controlling changes to established project baselines and thresholds. These baselines include the project's performance baselines; contract/subcontracts; hardware; software; and approved design and constuction documents. The extent to which a project can establish its baseline and successfully manage those baselines is invariably a direct indicator of the probability of the project being successful, i.e., meeting project requirements on schedule and within budget (see Section 5).

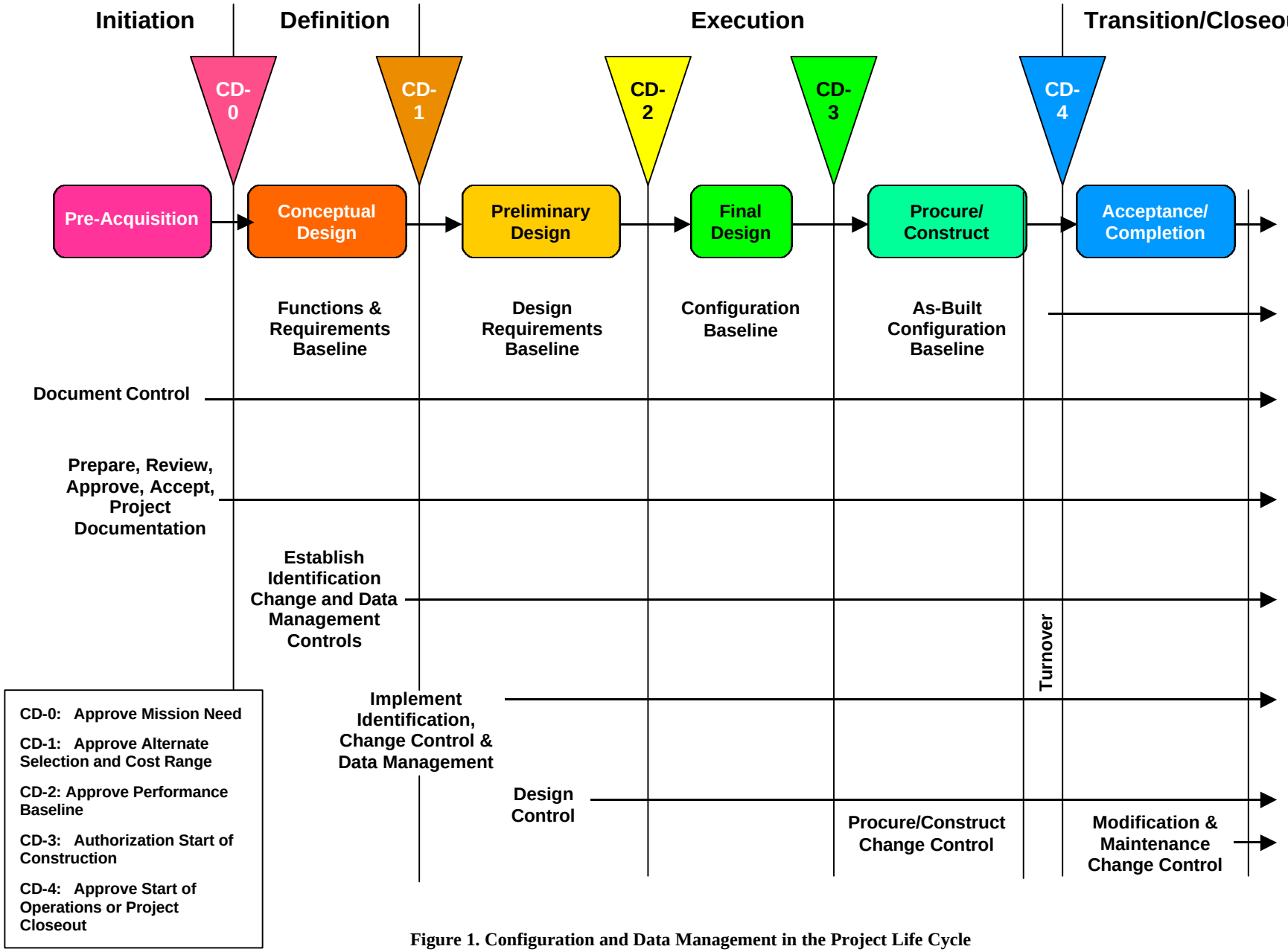


Figure 1. Configuration and Data Management in the Project Life Cycle

2.0 PURPOSE

Configuration management is the process used to ensure and document that project facilities, structures, systems, subsystems, and components, as well as supporting documentation, interface physically and functionally. This process also ensures that the project's configuration is in agreement with the performance objectives defined in the technical baseline, and that schedule and cost baselines are established, approved, and controlled. Configuration management is a critical component both of the Integrated Safety Management System and the operation and maintenance program. The PD/PM should initiate a configuration management system early in the development of the project, and ensure the delivery of complete as-built documents at the close of the project. Configuration management control begins with baselining requirements and ends with decommissioning structures, systems, and components in the operational facility.

Configuration management principles are used to the same degree during each project phase. These principles are tailored to fit the phase as well as the product application as determined by the project team.

3.0 CONFIGURATION MANAGEMENT APPLICATION

3.1 Scope

Configuration management processes should be applied to all project hardware, software, firmware, documentation, test and support equipment, facility space, spares, training, manuals and project commitment. A change control system ensures that documentation associated with an approved change to a project's configured system is updated to reflect the appropriate baseline. Affected documentation may include training materials, courseware, and other integrated support documentation.

3.2 Configuration Management and Baseline Management

Within DOE, the terms, "configuration management" and "baseline management" have been used with some degree of confusion. The purpose of this section is to clarify the relationship.

- *Configuration Management*. At any point in its life cycle, from Initiation to Transition/Closeout, a project has a configuration. Initially, its configuration is a conceptual arrangement of the parts or elements of the desired end product(s). As the project proceeds through its life cycle, its configuration is defined in greater detail through the design process and documented in specifications and drawings. At the end of the life cycle the configuration is the actual physical and functional configuration of the end product(s) as reflected in as-built documents. Configuration management is used to

identify and document the configuration of the end product(s) and control changes to the configuration during the life cycle.

- *Baseline Management*. At selected points in a project's life cycle, the current configuration is established as a reference point or technical baseline. The technical baseline is combined with other project activities (e.g., activities to construct or activities to conduct remedial action) to form a scope baseline. The scope, schedule, and cost baselines serve as a basis for project authorization, management, and an approved basis for measuring progress and reporting status during project performance. As such, the scope, schedule, and cost baselines are the established plan or performance baseline against which the status of resources and the progress of a project are measured. Baseline management is used to measure progress and control baseline changes to approved baselines, including scope, schedule, cost, key parameters (KPs), and thresholds.

Configuration management and baseline management are integrated in that the baselines are derived from the same configuration, and they often share a common change control process.

3.3 Configuration Management Processes

All projects should perform to the planning, identification, change control, status accounting, verification, and audit activities described as follows:

3.3.1 Configuration Management Planning and Administration

This activity includes planning, coordinating, and managing all tasks necessary to implement configuration management principles and conduct configuration management activities. Configuration management planning and administration occurs throughout all project life cycle phases. Documenting the planning process and developing the configuration management plan and supporting procedures formalizes involvement and ensures continuity of configuration management processes at all management levels. (See Attachment 1 for a sample Reference Matrix for Configuration and Data Management Elements, and Attachment 2 for a sample Configuration Management Plan for the Tank Farm Contractor.) Training personnel in configuration management processes commensurate with their roles and responsibilities is also an ongoing configuration management requirement. Periodic assessments of process performance need to be performed to identify and implement improvements in the configuration management process.

3.3.2 Configuration Identification

Projects should identify configuration items and develop appropriate configuration documentation to define each configuration item (see Attachment 3 for a sample

configuration identification approach). This activity includes developing a product top-down structure that summarizes the total units and configuration documentation for the project, system, or configured item. Identification also includes assigning unique identifiers that identify units (and groups of units) in a product. Configuration identification and product information should be constantly maintained and readily available to all project participants. Baseline documentation is maintained with all necessary links to the information management system. Supporting documentation includes the numbers and other identifiers (e.g., document numbers, drawing numbers, equipment numbers) assigned to configuration items and documents, and the approved technical documents that identify and define configured items' functional and physical characteristics, such as specifications, drawings, and interface control documents and associated lists.

3.3.3 Data Management

Computerized information systems should be used to monitor configuration management technical baseline information and associated changes. The related databases should include an index of all configuration items and documents. Configuration management computer applications, along with the technical database and the record management computer applications, contain a substantial portion of the information necessary to substantiate full regulatory compliance (see Attachment 4 for a sample data management program).

3.3.4 Software Configuration Management

The configuration management program should ensure appropriate computer software is identified and controlled. Identification includes titles, manufacturer, data licensing agreements, responsible individuals, controlled access, and a record of all changes to the software (see Attachment 5 for a sample software configuration management program).

3.3.5 Document Control for Configuration Management

Documents should be controlled and distributed to ensure only the latest approved documents are being used for all project activities, and to ensure the removal/destruction of previous revisions of replaced documents. To accomplish this, all controlled documents (including revisions) are given a unique identification number. Approved distribution lists help ensure original and replacement documents are distributed to those authorized to obtain them, as does a receipt from the recipient of document delivery, or return of the old version of the document. This process is important to the project's success in providing approved products/deliverables (see Attachment 6 for a sample document control for configuration management program).

3.3.6 Configuration Change Control

Projects should implement a systematic and measurable change process consistent with DOE Order 413.3, and document that process in the approved Change Control Boards'

charters and operating procedures. The implemented, approved change process ensures proposed change are properly identified, prioritized, documented, coordinated, evaluated, and adjudicated. Approved changes are also documented, implemented, verified, and tracked to ensure proper incorporation into all project deliverables: structures, systems, and components.

3.3.7 Configuration Status Accounting

Projects should develop and maintain configuration information for their configured items or products in a systematic and disciplined manner in accordance with DOE policy and accepted configuration management processes and procedures. Status accounting information includes developing and maintaining project configured data and incorporating modification data for systems and configuration items. This configuration information should be available for use by decision-makers over the life cycle of the project. It provides an audit trail of change proposals, current baselines, and historic baselines. Data availability and retrievability should be consistent with the needs of various users.

3.3.8 Configuration Verification and Audit

The configuration management process should verify that a product's requirements have been met, and that the product design meeting those requirements has been accurately documented before a product configuration is baselined. Verification may take the form of a functional configuration audit or a physical configuration audit. The functional configuration audit provides a systematic comparison of requirements with the results of tests, analysis, or inspections. The physical configuration audit determines (generally, by operation/ maintenance) whether the product is consistent with its design documentation. In addition, operational systems are periodically validated to ensure consistency between a product and its current baseline documentation. Verification of the incorporation of modifications/ changes is a critical function of this activity. This validation includes verification of facility baselines and conduct of system audits at project acceptance and turnover. Audit discrepancies are identified, recorded, and tracked to closure.

3.4 Technical Baseline Identification

As discussed in Section 3.2, the project's technical baseline is combined with other project requirements and activities to form the scope baseline. The scope baseline is the basis for the project's schedule and cost baselines. The scope baseline defines the physical and functional configuration of the project's end product(s). The scope baseline, including frequent measurable milestones for reporting programs, defines the time in which the scope baseline is to be completed. The cost baseline defines the cost of completing the scope baseline in compliance with the schedule baseline. Baseline management controls the scope, schedule, and cost baselines, and integrates with configuration management that controls the technical

baseline. Data management controls project information and configuration of its end product(s).

The technical baseline consists of a top-down set of requirements in which all subsidiary requirements flow down from higher level requirements. For identification and reference purposes, each update to the technical baseline has been given a title corresponding to its content and/or relationship in the project's life cycle. The titles of the baseline may vary for a particular project, and there may be fewer or more baselines. Each project should tailor its baselines to meet its particular needs. A minimum set of technical baselines would be those required to support scope, schedule, and cost baseline submittals for Critical Decisions. Typical sequences of technical baselines are defined in the following paragraphs.

- *Functions and Requirements Baseline*. The initial (Functions and Requirements) baseline for a project is developed during the Conceptual phase and supports Critical Decision-1. This baseline identifies and establishes the functions and technical requirements for a project. At this early project stage, the configuration represented by the baseline is conceptual with nothing designed or built. The functions and requirements baseline is generally developed from the mission need statement and the mission objectives.
- *Design Requirements Baseline*. For complex projects, the design portion of the Execution phase is often divided into preliminary design and final design. Through the preparation of preliminary planning and engineering studies, preliminary design translates the functions and requirements from the Conceptual phase into preliminary drawings and outline specifications, life cycle cost analysis, preliminary cost estimates, and schedules for project completion. Preliminary design identifies long-lead procurement items and provides an analysis of risks associated with continued project development. At this stage of a project, the configuration defined by the preliminary drawings and outline specifications is represented by the design requirements baseline, which includes the following content:
  - Physical systems for each project or facility
  - Boundaries and interfaces for each physical system
  - The major components for each physical system
  - The functions and requirements, performance criteria, and constraints established in the Conceptual phase allocated to the respective physical systems and major components
- *Configuration Baseline*. This baseline represents the output of the final design portion of the Execution phase and supports Critical Decision-3. The functions and requirements from the conceptual design and the design requirements from preliminary design, as applicable, are expanded to provide the detail required to procure or construct the

components, systems, and structures of the end product(s). The configuration baseline of the project is defined by the design output documents, which include procurement and construction specifications, drawings, test procedures, and operating and maintenance information.

- *As-Built Configuration Baseline*. At Critical Decision-4, the project's Execution phase is complete and the Transition/Closeout phase has begun. The detailed design documents established in the configuration baseline are used to establish the as-built configuration baseline as follows:
  - — All approved changes occurring to the configuration baseline during construction are incorporated and reflected in the as-built configuration baseline.
  - — All approved changes occurring to the configuration baseline during the Operations/ Maintenance phase (after system turnover and acceptance) are reflected in the as-built configuration baseline. This baseline exists and is maintained current throughout the Operations phase.

3.5 Establishment of Baselines

Development of baselines for DOE projects should adhere to the following management concepts set forth by DOE Order 430.1:

- Specification of a systematic process for baseline development
- Identification, documentation, and approval of basic requirements
- Formal identification and approval of baselines
- Specification of approved baseline thresholds and breaches
- Regular assessment and reporting of project status and performance against approved baselines
- Corrective management action (that may include baseline revision) in the event a project activity exceeds an established threshold.

3.6 Energy Systems Acquisition Advisory Board(s)

3.6.1 Major System Project Energy System Acquisition Advisory Boards

The Energy System Acquisition Advisory Board (ESAAB) advises the Secretarial Acquisition Executive (SAE) in approving all Major System project Critical Decisions, Level-0 baseline changes, Performance Baseline breach-level change decisions, and site selections for facilities for new sites. The ESAAB meets once every two months, or at the call of the SAE.

ESAAB membership includes the SAE as chair; the Undersecretary and National Nuclear Security Administration (NNSA) Administrator; the DOE General Counsel; the Director of

the Office of Management, Budget and Evaluation/Chief Financial Officer (OMBE/CFO); the Director of the Office of Engineering and Construction Management (OECM); the Assistant Secretary for Environment, Safety and Health; the Assistant Secretary for Environmental Management; the Deputy Administrator for Defense Programs; the Director for Office of Science; and the Director of Procurement and Assistance Management. The Deputy Secretary may designate other PSO or functional staff as board members as needed.

The ESAAB Secretariat resides in OECM and provides administrative and analytical support and recommendations to the ESAAB.

3.6.2 Non-Major System Project Energy System Acquisition Advisory Boards

The designated Acquisition Executive (AE) (Undersecretaries/NNSA Administrator) appoints an ESAAB-equivalent Advisory Board for advising on actions regarding those projects having a total project cost (TPC) between $20M and $400M. The AE for these projects serves as chair of the Advisory Board. The Advisory Board replicates and conducts identical functions to those performed by the corporate ESAAB. Members may be selected from within the AE. However, at least one member from an office not under the AE will be designated by a contributing representative. OECM will provide a member of each Advisory Board for projects having a TPC less than $400M. Each AE provides implementing documents and the composition of its Advisory Board to OECM. Agendas and minutes of all Advisory Boards are also provided to OECM.

3.6.3 Advisory Boards for Delegated Projects

Each PSO/Deputy NNSA Administrator may delegate equivalent AE functions, including decision approvals, for projects having a TPC between $5M and $20M to a Senior Executive Service Program Manager or an Operations/Field Office Manager. The Program Manager or Operations/Field Office Manager may further delegate equivalent AE functions to a direct reporting Senior Executive Service subordinate. The PSO and/or designated AE establishes and chairs an Advisory Board and notifies OECM of its composition, invites OECM to all board meetings, and provides all agendas and minutes to OECM and the appropriate Project Management Support Office. However, OECM is not a board member.

Delegations

The SAE may delegate AE functions to the Undersecretaries/ NNSA Administrator, except at Critical Decision-0 (Approve Mission Need) and Acquisition Strategy. The Undersecretary or Deputy NNSA Administrator may delegate equivalent AE functions, including Critical Decision approvals, for projects having a TPC less than $100M to a PSO or Deputy NNSA Administrator, except Critical Decision-0 (Approve Mission Need) and the Acquisition Strategy. For those delegated non-Major System projects having a TPC less than $100M, the PSO or Deputy NNSA Administrator can further delegate AE responsibilities to an Operations/Field Office Manager or Senior Executive Service program

manager, except Critical Decision-0 (Approve Mission Need). The AE so designated establishes and chairs an Advisory Board.

For projects having a TPC less than $20M, AE responsibilities can be delegated by the Operations/Field Office Manager to a Senior Executive Service direct reporting subordinate. Table 1 provides an overview of the AE delegations.

Table 1. Critical Decision Authority Thresholds

Critical Decision Authority	Total Project Cost	
Secretarial Acquisition Executive	**> $400M or < $400M when designated by SAE**	
Under Secretary/ NNSA Administrator (Acquisition Executive)	**< $400M**	**Acquisition Executive Delegation Allowed***
		To Program Secretarial Officers or Deputy Administrators/Associate Administrators for NNSA
Program Secretarial Officers or Deputy Administrators for NNSA	**< $100M**	To a Program Manager or field organization manager
	< $20M	To a direct reporting subordinate of the field organization manager

*Critical Decision -0, Approve Mission Need, may not be delegated below PSO or NNSA Deputy Administrator level. The Under Secretary/Administrator NNSA and the Deputy Secretary must be formally notified of all CD-0, Approve Mission Need, and CD-4, Approve Start of Operations or Project Closeout, decisions for non-major system projects $100M and over.

4.0 CONFIGURATION MANAGEMENT POLICY SUMMARY

Each project is responsible for:

- Developing and implementing configuration management plan(s) and processes
- The inclusion of appropriate configuration management principles in all acquisition contracts
- Life cycle management decisions for products/solutions assigned to their change control board
- Timely approval/disapproval of proposed changes to configured items under their purview for the life cycle of the items

- Analyzing changes completely and coordinating changes that impact other configured items within the project
- Referring proposed changes that exceed the change board approval authority to the next higher change board
- Establish baselines for all systems that are operational or that are scheduled for operation. The baseline process begins with establishing system/subsystem functional baselines and concludes with establishing and maintaining the project's scope, schedule, and cost baselines. Establishing and documenting configurations, creating baseline documentation, and controlling changes are included in this responsibility.
- Providing the user organization with detailed documentation describing the operational baseline at the time of turnover/acceptance. This documentation consists of the contractually agreed to as-built documents, updated to reflect the configuration at the time of turnover/acceptance, and the serialization/revision/version status of all hardware, software, and firmware. This documentation is in addition to the functional, allocated, and product configuration documentation. The PD/PM also ensures that the Operations/Field Office receives copies of the contractually provided manuals. Documentation describing the operational baseline is maintained as long as the system is operational.

5.0 CHANGE MANAGEMENT

Change management ensures that project changes are identified, evaluated, coordinated and controlled, reviewed, approved or disapproved, incorporated, tested, and documented in a manner that best serves the project. Errors, problems, opportunities, new management, the availability of new methods or tools, or funding changes can trigger project changes. Change control is essential, because uncontrolled changes lead to chaos, due to the far-reaching effects even small changes can have on a project's scope, schedule, cost, safety, risk, quality, and products.

Approved baselines are considered the primary controlled elements for each project and are typically identified as scope/technical, schedule, and cost. Change is a project occurrence directly related to the risks and uncertainties associated with baseline control. Figure 2 illustrates that relationship. The objective of a project change management process is to understand proposed changes to allow for better mitigation and management, not absolute prevention. For a PD/PM to successfully manage a project, they have to be able to manage changes through a dedicated, documented, controlled process. The goals of a change management process are to:

- Recognize and predict changes
- Evaluate and understand the consequences of proposed changes

- Ensure each proposed change to approved baselines is evaluated, reviewed, and approved/disapproved at the proper level of management
- Control the consequences of approved changes
- Prevent unauthorized and unintended deviations from approved baselines
- Ensure each approved change is appropriately implemented, tested and verified, and documented.

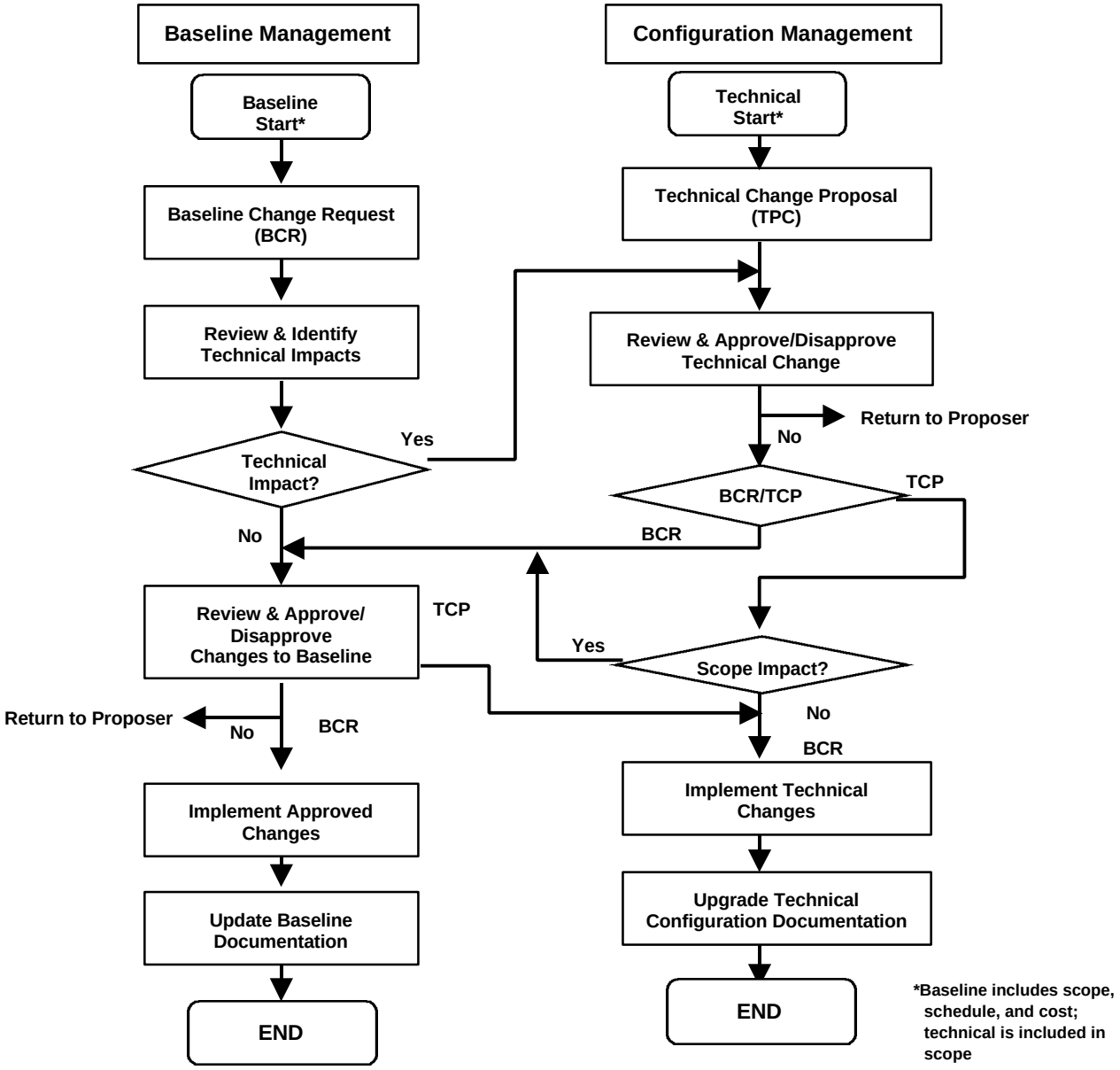


Figure 2. Overview of the Change Control Process

Project changes should be managed as are other project risks, by establishing a controlled process for identifying change and responding appropriately. This section presents principles and steps to consider when establishing a change management process for a DOE project. Although each step in the process is important, not all steps will apply to each type of change or to every project. What is important is to consider each step when deciding how to best manage change. The described process should be tailored to meet project needs.

5.1 Authority

Responsibility for change management exist at every management level and changes are monitored, reviewed and approved/disapproved by baseline change control boards at those levels. The following information describes formation and functions of the change control boards, explains control levels, and identifies typical responsibilities for each level.

5.2 Baseline Change Control Board

Three DOE organizational levels (Table 2) should establish a change control board for disposition of change proposals within their level of control (see Section 3.6). For the SAE, the ESAAB acts as a review board and a change control board. Advisory Boards (ESAAB-equivalents) serve as change boards at each lower management level. Each board should include a chairperson, a secretariat, members, and advisors. The board chair is ultimately responsible for any change decision, and as such is typically the one person with approval authority. Members and advisors sit on the board to advise the chairperson on technical, quality and reliability, financial, schedule, and, environmental, safety and health (ES&H) matters. Contractors are not usually members of DOE boards but may participate as advisors. Procedures for establishing a board should be part of a change board charter.

5.3 Control Levels

Three control levels govern change control authority for DOE projects—Level 1 is for the Under Secretary or NNSA Administrator; Level 2, PSO/Deputy Administrator; Level 3, PD as delegated by the Operations/Field Office Manager or Program Manager. The contractor(s) may also establish change boards as appropriate. Contractor change boards should be organized and should function in the same manner as DOE change boards. Thresholds limit the control organizational elements have over baseline approval and the change process. Proposed baselines and thresholds for each project are normally documented in the project planning documentation and are approved at the PB. Change thresholds are established in the PEP. Typical thresholds are shown in Table 2.

Table 2. Sample Change Control Authority Matrix

Approval Authority
Level-1 Changes – Under Secretary or NNSA Administrator Level-2 Changes – PSO/Deputy Administrator Level-3 Changes – Project Manager as delegated

Major and Non-Major System Projects:			
	Level-1	**Level-2**	**Level-3**
Technical	Changes to technical requirements and parameters that do not meet mission need objectives	Changes to technical requirements and parameters that affect safety basis, operation functions but do not affect mission need	As defined in the Project Execution Plan (PEP)
Schedule	6 or more months increase (cumulative) in a project-level schedule milestone date, not exceeding the PB threshold	3 to 6 months increase (cumulative) in a project-level schedule milestone date	As defined in the PEP
Cost	Increase over $50M and/or Increase in TEC requiring Congressional reporting and not exceeding the PB TPC	Increase over $25M	As defined in the PEP

5.4 Change Control Board Guidance

Each change control board should prepare a charter and operating procedures. The charter describes the purpose, authority, and composition of the board. Operating procedures describe how the board functions. For example, change submittal process; presentation requirements; meeting frequency, location and time; preparation and distribution of board meeting minutes and decisions. Board charters and procedures are maintained to reflect changes in board membership, in authority/responsibility, etc.

5.4.1 Inputs to Change Requests

A project's change control framework is established in the PEP. The PEP provides the baselines against which changes are monitored and controlled. Also, baselines are compared against project performance and reported in monthly performance reports.

Once a scope baseline has been established, engineering change requests are a method of requesting changes. However, during design, design change requests may be used for minor design errors/changes, and during construction, field change requests may similarly be used to disposition minor field errors/changes. These methods of initiating changes, however, are

monitored and approved using a tailored change control process. All such changes are reflected in the appropriate project documents.

5.4.2 Change Principles and Processes

Responsibility for change management exists at every management level, and changes are monitored and approved/disapproved by change boards at the appropriate level. However, regardless of the source or the seeming innocence of a requested change, the PD/PM is ultimately responsible for ensuring that requested changes are documented, evaluated, processed, and dispositioned. And if approved, properly implementing the change and reflecting the change in project documentation.

5.4.3 Change Initiation

The initiator of a change proposal prepares the change request describing the change and identifying the amount of budget required or to be returned as a result of the change. The initiator also describes the scope of the change, any schedule impacts, as well as a detailed analysis of the change's impact. The analysis of a change should be comprehensive, including cost, scope, and schedule baselines, as well as: design, construction, safety, quality, procurement, performance, personnel, training, other projects, other facilities, documentation, and so forth. A structured method of evaluating the impacts of a proposed change is for the PD/PM to require that a completed and signed pre-established project change impact checklist accompany each change request. This is particularly important during project Execution because of the potential impact of seemingly small changes.

Each project should establish and maintain a change control log from which a unique number is assigned to each change request, and in which the title, scope, schedule, and cost of the change are recorded, along with the disposition of the change and any assigned action items. If the change impacts project allowances, then entries also appear in the project allowance log.

Often, a project change is caused by a Congressional action, such as an Appropriations Act that reduces funding. In such cases, the PD/PM prepares a project change request and submits it through normal channels for review and approval. The change is documented and approved by the appropriate SAE/AE within 3 months from the time the Congressional action occurred.

5.5 Types of Baseline Change

Three types of baseline change typically exist in a formal change management process: discretionary, directed, and emergency:

- *Discretionary Changes*. May be proposed, approved, modified, or rejected within the limitations described in Section 5.3. Discretionary changes are proposed and approved or rejected through the approval process at the appropriate change board level.
- *Directed Changes*. Are mandatory and should require priority handling, which includes notification of and acknowledgment by the appropriate board chair or decision maker. When the directed change affects a baseline, an impact assessment should be prepared at the appropriate control level and submitted to the issuing authority for review prior to implementation. The issuing authority may modify the change request to lessen its impact (if possible). Implementation of all directed changes should be incorporated into project planning documentation, as quickly as possible, with modifications made as required in contracts and baselines.
- *Emergency*. Alerts the appropriate board chair of a planned action to prevent a catastrophic situation from developing. Although prior approval is not always possible due to the urgency of the situation, when time permits, project management should obtain approval from the appropriate chair prior to implementing an emergency change.

5.6 Change Control Steps

No matter what type of change occurs in a project, management of the change consists of six general steps. Simpler changes may have two or more steps merging together, while more complex changes may involve intermediate steps. The key to change management is to always consider these general steps and consciously decide how best to accommodate or control each separate change. When practiced at each step, a PD/PM will not only be able to better control the impacts of change, but will be able to foresee changes and trends in time for prevention or mitigation. The change management process includes the following steps for each type of change. The intent is to include the change board chair in the decision process before the situation becomes critical.

- Discretionary Changes

  Step 1. Identify or propose a necessary change to correct project planning deviations

  Step 2. Require that the proposed change be a written submittal

  Step 3. Evaluate the change with respect to project impacts, particularly scope, schedule and cost

  Step 4. Approve/Reject the change at the appropriate control level

  Step 5. Incorporate approved changes into project planning documentation and contracts

  Step 6. Evaluate the change by assessing actual project impacts resulting from the change against projected impacts.

- Directed Changes

Step 1. Recognize the change as a directed action by the proper authority

Step 2. Require that the proposed change be a written submittal

Step 3. Quantify the impending baseline impacts of the change

Step 4. Accept the change at the implementing level with notification of the proper organizational elements that a change has occurred on the project or is imminent

Step 5. Accommodate the change by making the physical corrections and updating the impacted project documentation

Step 6. Evaluate the change by assessing actual project impacts resulting from the change against projected impacts

- Emergency Changes

  The steps for emergency changes may coincide with either a discretionary change or directed change depending on the situation. Management should follow the steps for discretionary changes (when time permits) to implement an emergency change to prevent a catastrophic or dangerous situation from developing. On the other hand, instances will arise when management has to take quick and immediate action due to an extreme or urgent situation. In such cases, the PD/PM should make the emergency changes and assess baseline impact and process the necessary documentation as a directed change after the fact.

5.7 Baseline Change Management Approval and Implementation

- *Procedures*
  - — Control. Because most change management takes place in the field, management may have detailed and specific procedures for implementing the change control steps. Headquarters organizations normally have similar procedures.
  - — Approval. No discretionary change should be implemented without approval by the appropriate change board chair. The approval process for directed changes is often just the notification of and acknowledgment by the proper organizational office. For emergency changes, management should attempt to obtain approval of emergency changes from the change board chair, if possible. As for contractor change control process, each PD should monitor their contractor's change management processes to ensure change approvals are occurring at the appropriate control level.
  - — Implementation. A directed change gives project management the authority to implement the change, but before implementation occurs the affected change board chair should review the potential baseline impacts and inform the appropriate management levels. When a directed change exceeds the approved baseline

objectives or thresholds, the PD should submit an impact assessment to the appropriate secretariat. If the impact cannot be assessed in less than one month of a directed change, the PD should formally notify the issuing authority. The PD should attach a copy of the change direction to the impact assessment. Directed changes should not be used as a means to correct cost or schedule baselines to keep the project within the planned budget or schedule.

- *Time Frames*. Whenever possible, each change board chair should provide disposition on change requests within the following time frames. Disposition includes processing a complete change request (no revision necessary) from receipt by the secretariat to disposition by the change board chair.

Change Designation	*Time Frame*
Emergency/Immediate Change	1 day
Directed/Priority Change	10 working days
Discretionary/Routine Change	20 working days

- *Objectives and Thresholds*. The PB is defined by objectives and minimum threshold values that are converted into key parameters (see the Manual Chapter 8 and Practice 17). The objectives values are established for performance, schedule, and cost, and represent the desired project mission objectives. The threshold values are more conservative objectives for performance, schedule, and cost that represent the PB boundaries, and are the essence of the project's and DOE's commitment to Congress. These key parameters define the necessary elements of a PB in terms of performance, schedule, and cost. Key parameters are those that, if the thresholds cannot be met, the AE would require a re-evaluation of the project's concepts, design approaches, and acquisition strategy for the acquisition. The PB key parameters should represent the project as it is expected to be completed. The total number of key parameters should be the minimum number needed to characterize the three major acquisition drivers: performance, schedule, and cost.
- *Baseline Limits and Rebaselining*. Based on scope, cost, or schedule allowances, the estimate at completion (EAC) may be greater than the TEC/TPC. This alone does not provide justification to rebaseline. Rebaselining should occur only when necessitated by significant unrecoverable project delays or events, forcing the difference between EAC and TEC/TPC to be so great that it is no longer feasible to continue under the current baseline. This rule should be the standard for setting all baseline limits or the range of deviation allowed within an approved baseline.

5.8 Contracts

Project contract and subcontract changes are managed in the same manner as any other project change, regardless of the purpose of the contract (design, construction, procurement, support services), or the type of contract (fixed price, cost plus, time and materials). In this case, the approved contract becomes the baseline and all requests for changes are evaluated against the baseline. Typically each contract/subcontract has scope, schedule, and cost baselines similar to the project. Any deviation from these baselines needs to be evaluated for impact and dispositioned in the same manner as a project change request. In the case of a contract/subcontract change (modification), the change board should include contract, legal, and procurement representatives as advisors. All contract/subcontract changes must be implemented by the DOE contracting officer or the Contracting Officer's Technical Representative.

5.9 Documentation

When changes to project baselines or contracts are approved, the PD/PM ensures that the changes are implemented as approved, and not allow changes to become more or less than intended. The PD/PM is also responsible for ensuring that implemented changes are accurately reflected in project documents, e.g., drawings, specifications, contracts, as-builts, safety, requirements, etc., as soon as practical

5.10 Reporting

Because of the importance of changes (and change management) to a project's success, the PD/PM should ensure changes are reported in the monthly project status report, and reported and discussed in the monthly project status review meeting. The purpose of reporting this information is to:

- Keep management informed
- Maintain continuous disclosure of the number of changes, the major sources of changes, and the impact of individual and cumulative changes on project baselines
- Provide trend information on use of allowances, significant increases/decreases in the rate of change requests, and potential for the project to experience a breach.

5.11 Attachments

Attachment 1 provides a sample Reference Matrix for Configuration and Data Management Elements. Attachment 2 provides a sample Configuration Management Plan. Attachment 3 provides a sample Project Change Log along with instructions on how to complete the log

ATTACHMENT 1. SAMPLE REFERENCE MATRIX

Reference Matrix for Configuration and Data Management Elements

1. CONFIGURATION MANAGEMENT PLANNING

Each participant in a DOE program, project or the activities of an operating facility should plan for configuration and data management.

For Strategic Systems; other projects with high visibility, high risk, high complexity, and/or high cost; and all operating facilities the configuration and data management planning should be formalized in a Configuration and Data Management Plan that describes how the participant will manage and conduct configuration and data management. For less complex projects, configuration and data management planning could be included in project execution planning documents.

For medium and low risk projects, configuration management and data management planning should be included in project planning documentation such as a project execution plan, clean-up planning documents for environmental restoration, or a program agreement for research and development.

When multiple participants are involved, the DOE Elements responsible for the program, project or operating facility should ensure integration of the configuration and data management processes included in the participants' planning documents.

2. DETERMINING NEEDED CONFIGURATION AND DATA MANAGEMENT ELEMENTS

Determining what configuration and data management elements should be included in a program, project or operating facility is specific to the risk, complexity, visibility and cost. It is also dependent on the specific activities being performed.

For projects, a recommended first step is to evaluate the risk and determine a graded approach.

Project Execution and Engineering Management Planning. For operating facilities, DOE-STD-1073-93, *Guide for Operational Configuration Management Program*, should also be referenced.

A recommended second step is to use the outline for a configuration and data management plan included in this appendix. The outline is provided in both a standard outline format and as

an annotated outline in a matrix format. The matrix format identifies key configuration and data management products and references specific to each section of the outline. Appropriate configuration and data management elements can be determined by selecting the products applicable to program, project or operating facility specific activities and applying controls consistent with the previously determined risk and graded approach.

3. CONFIGURATION MANAGEMENT PLAN OUTLINE

Formal stand-alone Configuration Management Plans should conform to the following outline. The page references are to pages of the annotated version of the outline included in this attachment. Note that there are two section fives: one for Projects and one for Operating Facilities. Use the one that is appropriate.

Recommended Configuration Mgmt. Plan Annotated Outline	Key Configuration Mgmt. Products	References
Section 1 – Introduction Cover Sheet – should provide the nomenclature of the system or product, contractors, contract numbers, and date of issue. 1.1 Table of Contents 1.2 Special Material Features – the special features of the participant's facilities, which have a determining effect on the nature of the configuration management program, should be briefly described. 1.3 Special Organizational Features – characteristics such as manufacturing capabilities, design and drafting personnel, and organizational relationships should be defined. 1.4 Other and/or Special Considerations – this section should address peculiarities of the configuration management program that result from participation by a large number of organizations, use of many commercial items, use of existing drawings and specifications or other departures from the normal, and innovations for more effective configuration management should be described here. It should also address such traditional CM aspects as training, CM responsibilities and integration with subcontractors, suppliers, etc. Note: Many of the references listed for this section, such as EIS/IS-649, *National Consensus Standard of Configuration Management*, cover all aspects of configuration management and can be referenced for other sections of the CM Plan. Note: There are two section 5s included in this outline: one for Projects and one for Operating facilities. Use the one that is appropriate.		2.1 Process Overview 2.1.1 Plans and Procedures 10 CFR 8301.120, Quality Assurance DOE Order 4301.1, LIFE-CYCLE ASSET MANAGEMENT DOE Order 5700,6C, QUALITY ASSURANCE DoD Directive 5010.19, *DoD Configuration Management Program* EIA/IS-649, *National Consensus Standard for Configuration Management* EIA/IS-632, *Systems Engineering* IEEE P1220, *Standard for Application and Management of the Systems Engineering Process* ISO 100007, *Quality Management – Guidelines for Configuration Management* MIL-STD-973, *Configuration Management* MIL-HDBK-61, *Configuration Management Handbook* NIRMA PP-02, *Position Paper on Configuration Management*
Section 2 – Organization This section should outline the participant's organization and the organizational relationships of the individuals and activities involved in the configuration management. 2.2 Responsibilities – individuals in the participant's organizational structure, in related participant's organizations, and in Government activities should be depicted. The responsibilities of each should be defined. 2.3 Structure – personnel and organizational relationships	- Responsibility Assignment Matrix - Interface Control Documents - Configuration and Data Management Policy	2.2 Roles 2.3.8 Interface Control

Recommended Configuration Mgmt. Plan Annotated Outline	Key Configuration Mgmt. Products	References
should be outlined in chart form. 2.4 Policy Directives – policy directives that govern the program should be listed. Procedures should not be included in this section.		
Section 3 – Technical Baseline Identification 3.1 Configuration Identification The sites, facilities, structures, systems and components of DOE projects, programs and operating facilities important to the environment, safety and health and other structures, systems and components that are deemed critical to the DOE mission should be included in this configuration management program. This section should describe the process and methods of identifying components of the end product(s) subject to control and the supporting documentation which defines the project and components. It should also discuss how numbers and other identifiers (e.g., document numbers, drawing numbers, equipment numbers) will be assigned. 3.2 Technical Baselines Requirements covering preparation, submission for DOE approval, and subsequent release of the Departmentally approved documentation which defines each of the required baselines should be established in this section. The participant's method under which the documentation should be prepared, approved by DOE, and released, should be described and the time periods in which these steps should be accomplished should be indicated	- Master Equipment List - Safety Equipment List Identification Schema for: - Structures, Systems & Components - Computer Software - Waste Characterization Data and Samples - Waste Packages - Documentation - Functions and Requirements Baseline - Design Requirements Baseline - Configuration Baseline - As-Built Configuration Baseline	2.3.5 Configuration Identification App B Configuration Identification App F YMP Configuration Identification Plan 2.3.2 Technical Baseline Identification 2.3.3 Establishment of Baselines 2.3.6 Traceability 2.4.1 Technical Baseline for Projects 2.5.1 Technical Baseline for Facilities
Section 4 – Configuration Change Control 4.1 Change Control for Programs, Projects, and Operating Facilities This section should describe the process of managing proposed changes to configuration items and technical documentation to ensure proposed changes are accurately described, systematically reviewed and evaluated for impact, properly implemented upon approval, and properly closed out. The change control process should provide for technical scope, cost and schedule reviews which are documented as a change package. Procedures for control of	Change Control - Procedures - Approval Criteria/Thresholds - CCB Charter Interface Control - Procedures - Documents/Drawings - Interface Control Working	2.3.4 Change Control 2.3.4.4 Participant CCBs 2.3.8 Interface Control 2.3.12 Control of Deviation and Waivers 2.3.13 Waste Inventory Configuration ASME Y14.24M, Engineering Drawing Types ASME Y14.34M, Associated Lists ASME Y14.25M, Revisions to Engineering Drawings

Recommended Configuration Mgmt. Plan Annotated Outline	Key Configuration Mgmt. Products	References
interfaces and processing requests for deviations of waivers should also be outlined in this section. Processes and controls specific to projects or operating facilities should be addressed in Section 5 & 6, respectively.	- Group Charters/Procedures - Procedures to Control - Deviations and Waivers - Procedures to Control Waste - Inventory Configuration - Waste Inventory Data Base	Drawings
4.2 Computer Software Change Control Controls should be established for new computer software and modifications to existing software to ensure that the software performs its designed function. This section should identify the controls that will be applied to the development and revision of software used to perform functions necessary for facility safety and reliability.	- Procedures for Development and Acquisition of Software - System Requirements - Specifications - Quality Assurance Plan - Verification and Validation - Plans/Reports - Users Manual - Procedures for Change Control of Software - Procedures for Discrepancy Reporting and Error Notification	2.3.7 Software Configuration Management 2.6 Computer Software Change Control 2.6.1 Software Change Control 2.6.2 Software Change Packages 2.6.3 Periodic Verification 2.6.4 Records App D Software Configuration Management App F YMP Configuration Identification Plan ANS/IEEE Standard 828-1990, *Software Configuration Management Plans* ANS/IEEE Standard 1042-1987, *Guide to Software Configuration Management* EIA Standard IS/640, *Software Development* ISO/IEC 12220, *Information Technology Software* ISO/IEC 12220-2, *Configuration Management Software*
4.3 Technical Reviews The technical review of a proposed change to facility design, facility test, or facility procedures should evaluate the overall effect of the change on the existing facility (e.g., design and operation). This section should define a technical review program that includes the formal process of viewing, confirming, or substantiating the adequacy of a change.	- Reviewer Qualification and Training Criteria - Procedures for Conducting Technical Reviews - Safety Evaluation Applicability Reviews - Safety Evaluations	2.7 Technical Reviews 2.7.1 Applications Requiring Technical Reviews 2.7.2 Administrative Controls 2.7.3 Technical Review Procedures 10 CFR 830.110, *Safety Analysis Reports*, March 1996

Recommended Configuration Mgmt. Plan Annotated Outline	Key Configuration Mgmt. Products	References
		10 CFR830.112, *Unreviewed Safety Questions*, March 1996 10 CFR 830.320*, Technical Safety Requirements*, March 1996 DOE 5480.5, *Safety of Nuclear Facilities* DOE 5480.21, *Unreviewed Safety Questions* DOE 5480.22, *Technical Safety Requirements* DOE 5480.23, *Nuclear Safety Analysts Reports* DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports*
4.4 Document Control for Configuration Management Programs, projects and operating facilities should establish a document control program that ensures technically correct and readily accessible information is provided to program and project participants and to support facility operations. This section should cover the important aspects of a document control program.	- Document Control Procedures - Controlled Document List - Standard Distribution List	2.8 Document Control for Configuration Management 2.8.1 Document Control Administration 2.8.2 Procedures 2.8.3 Drawing Control 2.8.4 Vendor Information App E Document Control for Configuration Management
Section 5 – Configuration Change Control for Projects This section should describe the process that ensures changes to the configuration of the end product(s) and their components and changes to project technical baselines are reviewed, authorized, properly executed and verified to be complete and closed out.	- Change Control Procedures - Standardized Change Proposal Forms - Change Reviews and Impact Evaluations - Auditable and Traceable Change Documentation	2.4.2 Change Control for Projects 2.4.2.1 Change Initiation and Submittal 2.4.2.2 Change Review and Impact Evaluation 2.4.2.3 Change Disposition 2.4.2.4 Directed Changes 2.4.2.5 Change Implementation 2.4.2.6 Training 2.4.2.7 Change Closeout

Recommended Configuration Mgmt. Plan Annotated Outline	Key Configuration Mgmt. Products	References
		2.4.2.8 Change Tracking
Section 5 – Configuration Change Control for Operating Facilities For operating facilities, a configuration change is any modification of the technical baselines, the facility's configuration or the operating procedures and limits. This section should describe the configuration change control process that ensures that proposed changes are reviewed against baseline documentation and all affected elements of the technical baseline are updated as needed. Traditionally, this section should describe processes for: (1) modification control (2) temporary modification control, and (3) set point control.	- Work Control Procedures - Change Control Procedures - Standardized Change Proposal Forms - Change Reviews and Impact Evaluations - Auditable and Traceable Change Documentation	2.5.2 Operating Facility CCBs 2.5.3 Work Control 2.5.4 Change Control for Operating Facilities 2.5.4.1 Change Initiation and Submittal 2.5.4.2 Change Review and Impact Evaluation 2.5.4.3 Change Disposition 2.5.4.4 Directed Changes 2.5.4.5 Change Implementation 2.5.4.6 Training 2.5.4.7 Change Closeout 2.5.4.8 Change Tracking 10 CFR 830.310, *Conduct of Operations at DOE Nuclear Facilities,* March 1996 10 CFR 830.340, *Maintenance Management*, March 1996 DOE Order 430.1, LIFE-CYCLE ASSET MANAGEMENT DOE 4330 4A, CONDUCT OF MAINTENANCE AT DOE FACILITIES DOE 5480.19, CONDUCT OF OPERATIONS AT DOE FACILITIES DOE-STD-1073-93, *Guide for Operational Configuration Management Program* INPO 85-031, *Requirements for the Conduct of Technical Support at Nuclear Power Stations*
5.1 Modification Control A modification is any planned change in the design of a facility structure, system, or component. Modifications may	- Procedures for Modification Control - Design Documentation	2.5.5 Modification Control 2.5.5.1 Requests for Facility Modifications

Recommended Configuration Mgmt. Plan Annotated Outline	Key Configuration Mgmt. Products	References
result from an approved change proposal or be directed by management. This section should address administrative controls that ensure modifications to facility SSCs are properly designed, reviewed, approved, installed, tested, and documented.	- Installation Documentation - Revised Safety Analysis - Revised OSR/TSR Limits - Revised Operating & Maintenance Procedures, Documentation, and Training Materials - Revised Vendor Manuals	2.5.5.2 Design 2.5.5.3 Installation 2.5.5.4 Documentation 2.5.5.5 Training 2.5.5.6 Quality Verification 2.5.5.7 Materials Procurement 2.5.5.8 Schedule 10 CFR 830.310, *Conduct of Operations at DOE Nuclear Facilities*, March 1996 10 CFR 830.340, *Maintenance Management*, March 1996 DOE 4330 4A, CONDUCT OF MAINTENANCE AT DOE FACILITIES DOE 5480.19, CONDUCT OF OPERATIONS AT DOE FACILITIES DOE-STD-1073-93, *Guide for Operational Configuration Management Program* INPO 85-031, *Requirements for the Conduct of Technical Support at Nuclear Power Stations*
5.2 Temporary Modification Control for Operating Facilities Temporary modifications are usually minor operations to facility components, equipment, or systems with respect to approved drawings or other design documents. This section should describe the administrative control systems for installation of temporary modifications and should include processes that ensure temporary modifications to in-service facility components, equipment, and systems are properly evaluated, authorized, and controlled using methods similar to those for permanent modifications.	- Procedures for Temporary Modification Control - Temporary Modification Control Log - Shift Training on Temporary Modifications - Annotated Drawings, Procedures - Temporary Modification Tagging - Temporary Modification Audits - Verification of Temporary Modification Removal	2.5.6 Temporary Modification Control 2.5.6.1 Technical Review 2.5.6.2 Authorization 2.5.6.3 Installation 2.5.6.4 Documentation 2.5.6.5 Reviews of Installed Temporary Modifications 10 CFR 830.310, *Conduct of Operations at DOE Nuclear Facilities,* March 1996 DOE 54801.19, CONDUCT OF OPERATIONS AT DOE FACILITIES DOE-STD-1073-93, *Guide for Operational*

Recommended Configuration Mgmt. Plan Annotated Outline	Key Configuration Mgmt. Products	References
		Configuration Management Program
5.3 Setpoint Control for Operating Facilities This section should describe a setpoint control program that ensures safety system setpoints are documented and controlled in order to preclude any process parameter deviations from safe operation without detection.	- Procedures for Setpoint Control - Safety System Setpoint List - Documented Technical Basis and Reviews - Installation/Implementation Documentation - Revised Safety Analysis - Revised OSR/TSR Limits - Revised Operating & Maintenance Procedures, Documentation, and Training Materials	2.5.7 Setpoint Control 2.5.7.1 Facility Setpoint Document Control 2.5.7.2 Program Procedures 2.5.7.3 Technical Review of Proposed Changes 2.5.7.4 Implementation 2.5.7.5 Closeout 10 CFR 830.310, *Conduct of Operations at DOE Nuclear Facilities,* March 1996 DOE O 5480.19, CONDUCT OF OPERATIONS AT DOE FACILITIES DOE-STD-1073-93, *Guide for Operational Configuration Management Program*
Section 6 – Data Management and Reporting 6.1 Data Management This section should outline plans for collecting, storing, handling, verifying, and reporting of configuration status information. It should indicate the techniques to be applied to provide a dynamic information system, responsive to the needs of the entire management team, as well as the manner in which the effectiveness of the Configuration Management Plan is implemented against any defined performance indicators.	- Configuration Management Computer Applications and Data Bases - Master Equipment List - Safety Equipment List	2.3.9 Data Management App C Data Management App F YMP Configuration Identification Plan
6.2 Reporting This section should describe reports that will be provided on various attributes of the end product configuration and the performance of the configuration management system.	Reports on: - End Product Configuration Status - Configuration Documentation - Current Historic Baselines - Change Requests - Change Proposals - Change Notices	2.3.10 Reporting

Recommended Configuration Mgmt. Plan Annotated Outline	Key Configuration Mgmt. Products	References
	- Variances - Warranty Data/History - Replacements by Maintenance Action - Configuration Verification and Audit Status/Action Item Closeout	
Section 7 – Reviews This section should address assessments performed to measure the effectiveness of the configuration management process, and consistency between the project physical system and the documentation that represents that system.	- Programmatic Assessments - Physical Configuration Assessments	2.3.11 Reviews 2.3.11.1 Programmatic Assessment 2.3.11.2 Physical Configuration Assessments

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Configuration Management Plan for the Tank Farm Contractor

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EXECUTIVE SUMMARY

The Configuration Management Plan for the Tank Farm Contractor presents how the discipline of configuration management supports the technical mission objectives of CH2M HILL Hanford Group, Inc. Configuration management ensures a systematic integration of procedures, plan and processes for controlling and preserving the integrity of the technical baseline. This plan identifies the methodology used to control the technical baseline and the interfaces with the programmatic baselines that ensures baseline accuracy, traceability, and retrievability, and provides users with the ability to make timely and informed decisions. As defined in this plan, configuration management establishes the necessary technical and administrative controls for a safe, economic, and environmentally sound management of products, processes, structures, systems, and components; and associated information throughout the Tank Farm Contractor life cycle. The Tank Farm Contractor will transition from the current mission of safe storage to that of an aggressive waste retrieval and disposal effort in which diverse functions of engineering, construction, and operations are performed to support mission objectives. As defined, the mission will use the best industry practices, applied through a graded approach, to execute the principles of configuration management that identify, control change, provide status, and verify the accuracy of information for the established technical baseline.

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CONTENTS

LIST OF APPENDICES

LIST OF ACRONYMS

BHI	Bechtel Hanford, Inc.
BNFL	BNFL Inc. (Privatization Contractor)
CEIS	Cost-Estimating Input Sheet
CHG	CH2M HILL Hanford Group, Inc.
CNS	Correspondence Numbering System
CVI	Certified Vendor Information (database)
DOE	U.S. Department of Energy
EDMS	Engineering Document Management System
FH	Fluor Hanford
FY	Fiscal Year
HDCS	Hanford Document Control System
ICD	Interface Control Document
ISMS	Integrated Environment, Safety and Health Management System
JCS	Job Control System
MEL	Master Equipment List
MYWP	Multi-Year Work Plan
ORP	Office of River Protection
P3	Primavera Project Planner
PNNL	Pacific Northwest National Laboratory
RAM	Reliability, Availability, and Maintainability
RIM	Records Information Management
RMIS	Records Management Information System
RPP	River Protection Project

SDF	Site Drawing File
SEL	Safety Equipment List
SSC	Structures, Systems, and Components
TBR	Technical Basis Review
TBSD	Technical Baseline Summary Description
TFC	Tank Farm Contractor
TWRS	Tank Waste Remediation System
USQ	Unreviewed Safety Question
WBS	Work Breakdown Structure

CONFIGURATION MANAGEMENT PLAN
FOR THE TANK FARM CONTRACTOR

1.0 INTRODUCTION

The Configuration Management Plan for the Tank Farm Contractor supports the management of the project baseline by providing the mechanisms to identify, document, and control the technical characteristics of the products, processes, and structures, systems, and components (SSC). This plan is one of the tools used to identify and provide controls for the technical baseline of the Tank Farm Contractor (TFC). The configuration management plan is listed in the management process documents for TFC as depicted in Attachment 1, *TFC Document Structure*. The configuration management plan is an integrated approach for control of technical, schedule, cost, and administrative processes necessary to manage the mission of the TFC. Configuration management encompasses the five functional elements of: (1) configuration management administration, (2) configuration identification, (3) configuration status accounting, (4) change control, and (5) configuration management assessments.

The TFC configuration management requirements are prescribed in RPP-POL-CONFIG, *Configuration Management Policy*. This plan implements those requirements and is responsive to the guidance presented in GPG-FM-012, Configuration and Data Management of DOE O 430.1A, *Life Cycle Asset Management*. The configuration management architecture presented in this plan is based on industry-proven practices presented in the EIA Standard ANSI/EIA-649, *National Consensus Standard for Configuration Management* and the DOE Standard, DOE-STD-1073-93, *Guide for Operational Configuration Management Systems, Including the Adjunct Programs of Design Reconstitution and Material Condition and Aging Management*.

2.0 PURPOSE

This plan provides clear traceability to procedures, plans, and processes that implement the principles of configuration management. The success for the execution of the configuration management principles is demonstrated in the implementing procedures and processes identified in this plan. This plan does not provide a stand-alone doctrine for configuration management, but provides a clear and practical roadmap to the procedures, plans, activities, and controls for sound configuration management. Fundamentally, configuration management is not a program or process, but rather a discipline that provides an administrative structure for the necessary controls, either existing or required, of TFC=s procedures, plans, and processes.

The configuration management approach presented in this plan is consistent with the commercial sector and has proven to work effectively and efficiently. A primary result of this plan will be to identify the TFC mission products, processes, SSCs, and associated information within the technical baseline, determine the rigor of control, and identify the mechanisms for that control.

3.0 CONFIGURATION MANAGEMENT

This plan executes the configuration management requirements as defined in RPP-6017, *Draft Project Execution Plan for the Tank Farm Contractor* (Halverson 2000), which establishes policies and requirements for implementing the TFC mission. This plan directs and monitors the effective application of configuration management principles and practices. The plan identifies the principles for the configuration management scope; defines concepts and terminology; identifies and controls baseline; identifies management organizational and programmatic interfaces; establishes the policy and criteria for required information systems; and specifies implementing procedures. This plan describes how the configuration management principles will be implemented by maintaining technical consistency among the requirements, the technical information, and the SSCs. This plan reflects those actions and responsibilities necessary to implement these requirements to achieve technical integrity and consistency. The information associated with configuration items will be maintained as required by procedures throughout the life cycle of the TFC's mission. For specific TFC actions, procedures will be used to communicate how configuration management principles and requirements will be implemented. Personnel involved in the execution will be trained and performance will be measured (see paragraph 3.1.6 of this plan). Configuration management implementation will be assessed to determine compliance and effectiveness, including the need for procedure, plan, or process improvements (see paragraph 3.5.1 of this plan).

Attachment 2 depicts the product relationships that evolve from defining the source requirements to developing the product information and to acquiring the final configuration item. These relationships are active throughout the life cycle of the configuration item and, when any one of these relationships changes, the others will be evaluated to determine impact. A change control process provides a method to revise a product and determine the impact on other attributes of the configuration item. Selected configuration items within the tank farms will be identified and placed under control; the rigor of that control will be graded, and procedures will be established to implement that control.

3.1 CONFIGURATION MANAGEMENT ADMINISTRATION

The TFC Chief Engineer will ensure the successful implementation of configuration management consistent with the requirements established in this plan and HNF-SD-WM-SEMP-002, *Systems Engineering Management Plan for the Tank Farm Contractor* (O'Toole 2000). This configuration management plan supports the identification and control of configuration items. Consistency among requirements, configuration items (products, processes, SSCs), and associated technical information will be maintained throughout the life cycle, particularly as changes are made to a configuration item.

The TFC will perform the following three groups of tasks to implement configuration management: (1) Recovery Tasks -- Work that includes as-building (i.e., field verification and

design validation), design reconstitution; material condition and aging management of existing facilities and equipment, labeling, and training, (2) Ongoing Tasks -- Work inherent in current activities that include documentation of design activities, document control, records management, validation and testing, procedure control, work packages, change implementation, project as-building program, and closure; and (3) Improvement Tasks -- Work that includes implementation of work management tools to link information of the TFC plants and facilities.

These configuration management tasks will be addressed and integrated with the programmatic elements in the TFC work breakdown structure as defined in RPP-5044, *River Protection Project FY2OOO Multi-Year Work Plan Summay* (CHG 2000).

3.1.1 Implementing Procedures for Configuration Management

A functional description of configuration management and the basic actions for its implementation is provided in the procedures and processes as defined in the scope of this plan. Emphasis will be placed on the use of existing procedures to the fullest extent practicable. These procedures will be reviewed and evaluated as to their usefulness in implementing the TFC Configuration management plan and generated, updated, or deleted accordingly. If the existing procedures are inadequate, they will be revised to support the imposed requirements and mission objectives.

3.1.2 Graded Approach

A graded approach is used to identify and rank products, processes, and SSCs and to determine the type and amount of documentation that is required to define an SSC and ensure that adequate administrative controls exist. In addition, the graded approach is used to determine the level of analysis, documentation, and action necessary to support products, processes, and SSCs commensurate with the selected grade. The graded approach is identified in RPP-MP-600, Quality Assurance Program Description for the Tank Farm Contractor (CHG 1999b).

3.1.3 Configuration Management Scope

Configuration management applies to products, processes, SSCs, and technical information performed or provided within the TFC's mission. The TFC technical baseline is developed through the systems engineering process, reference HNF-SD-WM-SEW-002 (O'Toole 2000), defined by the documents established in the technical baseline summary description, reference HNF-1901, Technical Baseline Summary Description for the Tank Farm Contractor (Tedeschi ZOOO), and controlled within the scope of configuration management. Criteria for the selection of configuration items and associated technical information are provided in HNF-1901 (Tedeschi 2000).

3.1.4 Interface Management

Interface management administers the interface control requirements and physical interface definitions between two or more co-functioning elements. This requires the following:

- Establish the physical and administrative interfaces
- Develop any acceptance criteria at the point of transition
- Provide necessary contractor contributions to all interface control documents that control each interface.

3.1.4.1 ORP Interface Control Program

The Office of River Protection (OW) interface control program will establish the system to develop and maintain the physical and functional coordination jointly among the prime contractors of CHG and BNFL Inc. (BNFL), and the U.S. Department of Energy Office of River Protection (DOE/ORP). The requirement of interface control will be formally established in the CHG prime contractor with DOE/ORP. The program description is specified in RPT-W375-G00006, *Interface Integrated Product/Process Team Charter* (Curry and Gasper 1999b), and executed through the BNFL interface control documents. These interface control documents recognize the communication links between CHG and BNFL that document and control the design details required to support the orderly program evolution of storage, transfer, treatment, immobilization, and disposal of tank waste. The information at these controlled interfaces are the design features and administrative measures that ensure a safe, efficient, and environmentally sound completion of the RRP mission objectives from the prime contractors.

3.1.4.2 Tank Farm and Privatization Contractor Interface Control Program

The prime contractors of CHG and BNFL and the DOE/ORP will establish an interface control program that ensures joint participation in the management of the identified co-functioning interfaces. This bilateral participation will include the selection and documentation of physical and functional boundaries; identification of interface characteristics necessary to ensure compatibility of hardware, software, and processes; and the institution of necessary controls to preserve the integrity of these interface requirements. It is incumbent on the prime contractors to ensure that these interface requirements, established in the interface control document, are adequately disseminated throughout the contractors' respective document hierarchy to effectively communicate and coordinate the interface control requirements. These interface control measures are: (1) clearly identified in the affected documents; (2) executed within the specified design parameters of the interface control documents; (3) maintained through an interface change process (i.e., RPT-W375-G00005 *Guidelines for Revising External Interface Control Documents* [Curry and Gasper 1999a]) that ensures no changes will

be made to a requirement without agreement between CHG and BNFL, and released by the interface control governing body; and (4) implemented in a responsive and comprehensive manner.

Programmatic interfaces/agreements will be controlled using a Memorandum of Agreement, reserving interface control documents for technical definition agreements. The dissemination of interface requirements are identified and controlled within TFC in accordance with HNF-IP-0842, *RPP Administration*, Volume IV, Section 2.8, "Interface Control."

3.1.4.3 Interactions/nterfaces with Balance of Prime Contractors

TFC's interactions and interfaces with the other site prime contractors will be identified and controlled through the formal process of Memoranda of Agreement, as specified in HNF-IP-0842, Volume X, Section 3.3, "Memorandum of Agreement." TFC's interfacing with the prime contractors would be for the purpose of providing or receiving specific expertise or services. The prime contractors include Fluor Hanford (FH) - Project Hanford Management Contract; Bechtel Hanford, Inc. (BHI) - Environmental Restoration Contractor; Pacific Northwest National Laboratory (PNNL) -Research and Development Contractor; and Health Services Contractor.

3.1.5 Design Engineering

Design control is the technical and management process that begins with (1) identifying design inputs and constraints, (2) processing information, and (3) resulting in the issuance of requirements. For each design, the design process defines and documents the design inputs; identifies and adheres to the design constraints; performs and documents the analyses, calculations, and technical evaluations; and ensures that the design outputs are complete and accurately documented. The engineering process is described in detail in HNF-1947, Tank Waste Remediation System Engineering Plan (Rifaey 1998).

3.1.6 Integrated Safety Management System

The Integrated Environment, Safety and Health Management System (ISMS) establishes the systematic structure to integrate environmental, safety and health into management processes and work practices at all levels of administration, physical systems and activities. Comprehensive safety integration, as defined in RPP-MP-003, *Integrated Environment, Safety, and Health Management System Description for the Tank Farm Contractor* (CHG 1999a), enables the assigned work scope to be efficiently and effectively accomplished while protecting the public, workers, and environment. Configuration management provides the controls that (1) implements the established safety requirements in the HNF-SD-WM-SAR-067, *Tank Waste Remediation System Final Safety Analysis Report* (LMHC 1999); (2) disseminates these safety requirements through the design development process; and (3) then manifests safety requirements in the physical hardware (SSC), procedures, processes, and

technical information (e.g., drawings, specifications, operating procedures, purchase orders). If an acquisition of a configuration item or the need to change a configuration item occurs during the TFC mission, then an analysis is required to be performed through the Unreviewed Safety Questions (USQ) process, reference HNF-IP-0842, Volume IV, Section 5.4, "Unreviewed Safety Questions."

3.1.7 Training

Training for configuration management is distributed through the execution of the principles of configuration management, i.e., identification, change control, status accounting, and assessments throughout the full life cycle of the TFC's mission. This training program is specific for the function being performed, e.g., engineering, work control, purchasing, maintenance, using training plans, training material, and appropriate procedure information as specified in HNF-IP-0842, Volume III, "Training." The detailed personnel training requirements are categorized by job descriptions that are listed on the Internet at http://www.rl.gov/twrs/training/maintrnpage.html.

3.2 CONFIGURATION IDENTIFICATION

Configuration identification is the basis from which configuration items are defined, uniquely labeled, controlled, verified, and accountability maintained. These configuration items constitute the technical scope of the TFC mission and will be placed under configuration management. HNF-1901 (Tedeschi 2000) and the Hanford Site Technical Baseline Database (HSTD, n.d.) represent this technical baseline that identifies the products, processes, and SSCs, as described by their associated technical information. The Technical Baseline Summary Description will identify the technical baseline information and its predecessor and successor relationships. The technical baseline will be integrated with the cost and schedule baselines as defined by the multi-year work plan.

The configuration management terms are explained to provide a better understanding of their roles in configuration management. A configuration item is a product, process, or SSC that is/will be produced and/or used by the TFC. These configuration items are identified in the technical information (i.e., documentation) and are uniquely identified (e.g., component, equipment identification number) in accordance with HNF-IP-0842, Volume II, Section 6.1, "Tank Farm Operations Equipment Labeling." The unique identifier for the configuration item is required to ensure consistency, retrievability, and traceability to the technical documentation. Documentation that describes the technical characteristics is uniquely identified in accordance with HNF-PRO-604, Hanford Document Numbering System. Unique control numbers are obtained through the RIM personnel located in the 2750E building and at 2440 Stevens Center.

The following subparagraphs address the identification of configuration items and associated technical information. Control of changes to those configuration items and associated information is delineated in Paragraph 3.4 of this plan. Attachment 3 represents the

basic application of configuration management to configuration items and their technical information.

3.2.1 Configuration Item Selection and Control

Configuration items will be selected in accordance with the criteria specified in HNF-1901 (Tedeschi 2000), for control based on their importance to the TFC mission and risks that would result from inadequacy of the product. The equipment scope controlled by configuration management should be based on the functions provided by the SSCs and includes those SSCs involving safety design requirements (necessary to protect off-site personnel, on-site personnel, and facility workers from nuclear and other hazards), environmental design requirements (SSCs necessary to protect the environment from significant damage or to satisfy environmental requirements or permits), and mission design requirements (SSCs necessary to avoid substantial interruptions of the programmatic mission or severe cost impact).

As configuration items are identified, the related descriptive technical information will be examined to determine control. If control is unnecessary, there should be documentation to justify that decision. Sufficient information will be controlled to ensure the necessary technical, schedule, and cost data to acquire, build, operate (e.g., authorization basis), and provide support for the configuration item throughout its life cycle. This will include both information that will be maintained current to support the TFC and the information that will be archived as a historical resource. The design basis will be identified and traceable to the configuration item and related technical documents.

3.2.2 Tank Farm Contractor Technical Baseline

HNF-1901 (Tedeschi 2000) describes the technical baseline elements and their relationships. A web page has been established to provide an informational overview of the technical baseline for Phase 1 of the RPP Tank Waste Retrieval and Disposal mission. The Internet address is http://apweb02/rpptech/index3.cfm. This web site provides a convenient identification and linkage to relevant technical baseline information. Presently, this web page is for information only, but the official record documentation is available through Records Information Management. The technical baseline elements will be broken down to lower level work elements to define those configuration items and establish their rigor of control. Attachment 4 illustrates the flow of technical baseline information that is addressed by the HNF-1901 (Tedeschi 2000). The HNF-1901 will be used as a source document and basis for identifying configuration items. The documentation for the configuration item will describe the functional and physical characteristics, interfaces, and other relevant technical information.

3.2.3 Integrated Baseline

The TFC mission integrated baseline also referred to as the programmatic baselines are established in HNF-1946, Programmatic Baseline Summary for Phase I Privatization for the

Tank Farm Contractor (Diediker 2000). The TFC's integrated baseline planning process is a defined system and process that guides all aspects of the TFC to provide a consistent, efficient, and effective means for successful project development, performance, and delivery. It includes a comprehensive set of management and control processes to identify and control risk, integrate with configuration control, balance competing requirements, and integrate project work scope.

The Level 0 Logic, depicted in TWR-2086, River Protection Project Mission Logic, outlines the entire RPP mission including storage, Phase 1 waste vitrification demonstration, Phase 2 full-scale production, storage of immobilized wastes, and tank farms closure. The Level 1 Logic diagrams (see list in Paragraph 9.0 of this plan) define the work scopes and schedules down to work breakdown structure (WBS) Level 7. Technical basis reviews further define the work scope, at the WBS Level 8, and develops associated cost estimates. The Level 1 Logic development provides the detail that maps the work into the retrieval and disposal WBS. The WBS describes the budgeted scope needed to support the critical path schedule.

Upon completion of the Level 1 Logics, the preparation of the Technical Basis Review packages (TBR) is performed. The TBR process provides for development of the lower levels of the WBS and the lower levels of the schedule logic. TBRs document the definition of work to be performed, technical basis, reference documents, enabling assumptions, inputs, deliverables, trade studies, decisions, risk, labor and non-labor resources required to perform the work, organizational responsibilities for work performance, and defines how and when the work will be executed.

Activity-based cost estimating methodology is used to generate all cost estimates and are prepared to a level at which costs are tracked and performance is evaluated. Due to variations in the current phases of the TFC projects, several estimating techniques are used to construct the cost estimate. Approved commercial and government estimating methods used include analogy, definitive, parametric, factored, cost review, and update. In addition, formal construction project estimates are developed and maintained for the life of each line-item construction project in accordance with the U.S. Department of Energy (DOE) policy. Cost estimates are prepared in accordance with RPP-PRO-585, Cost Estimating. Each cost-estimating input sheet (CEIS) documents all costs including labor, equipment, materials and subcontracts and include the estimate basis, assumptions, and exclusions for each TBR activity.

The TFC developed an integrated, resource-loaded schedule for Phase 1 privatization. The scheduled prepared in Primavera Project Planner (P3)' was developed from, and is traceable to, the Level 1 Logics, formal TBR package data, and WBS. Resources from the CEISs were loaded and priced in P3 to produce the cost for each activity. The integrated resource-loaded schedule provides a time-phased plan with logical sequence of interdependent activities, milestones, and constraints.

Changes to these baselines, the elements that make up these items (e.g., Financial Data System rate structure), or the elements these items support (e.g., MYWP), will be performed in accordance with HNF-IP-0842, Volume VIII, Section 1.1, "Baseline Change Control."

3.2.4 Master Equipment List

The master equipment list (MEL) identifies the specific SSC/configuration item within the technical baseline that defines the physical and functional configuration of the TFC. Within the MEL, resides a smaller subset of SSCs that are classified as the Safety Equipment List (SEL) because of their designed safety function. Both the MEL and the SEL are maintained in databases and include the attributes of a component number, component type, facility, building, system, manufacture, model, serial number, etc. All components requiring routine maintenance by the preventive maintenance/surveillance program are currently maintained in the job control system (JCS) component index database. The SEL is established in HNF-SD-WM-SEL-040, *TWRS Facility Safety Equipment List* (Zaman 1999), maintained on the Internet at http://apsq101.rl.gov/selr/reports/report_list.asp. The MEL and SEL will be consolidated into a single JCS component index database.

3.2.5 Tank Farm Contractor Work Breakdown Structure

The TFC work breakdown structure (WBS) is the baseline integrating process that defines and displays the products to be developed and/or produced, relates these elements of work to be accomplished, and identifies their associated schedule duration and cost. Fundamentally, the WBS defines work scope based on the supporting logic decomposition, and the technical baseline information that is integrated into RPP-5044 (CHG 2000).

' P3 is a registered trademark of Primavera Systems, Inc.

3.3 CONFIGURATION STATUS ACCOUNTING

An accurate and timely information base describing a product, process, or SSC and its associated technical information is required throughout the configuration item's life cycle. Status accounting of configuration items will be accomplished by developing an information system that will list and status the technical information/documentation, including the item/information identifier and ownership (functional organization). The configuration status accounting process will identify the baseline documents (technical, schedule, and cost) and their supplements, including interface documents such as the multi-year work plan, performance incentives, and permits. As configuration items and associated technical information are identified, they will be systematically captured in the document database that is controlled by Records Information Management. The document control database will evolve and its contents will be updated to provide a history and status throughout the configuration item's life cycle. The technical information will be removed from the document control database by the appropriate change authorization as it is decommissioned, dismantled, discarded, destroyed, voided, or superseded. The technical information maintained in the document control database shall be available to TFC participants who need to know and make decisions to ensure integrity in the design evolution and for the conduct of safe operation.

3.3.1 Document Control Process

Technical documents for the TFC will be correlated, stored, maintained, and readily available in accordance with applicable procedures. Only approved revisions of these documents within the configuration management scope should be used in the conduct of operations. Revisions to documents to incorporate pending changes will be completed and available in a timely manner. The number of unincorporated document changes allowed to accumulate before revisions are implemented should be determined according to the priority of the document, the complexity of the changes, and the overlap of the changes (see Paragraph 3.4 of this plan). The following information should be readily available: revision level, current status document owner, information regarding pending changes, and other data necessary for control and tracking, such as storage location and outstanding document change notices. The types of documents that need to be included in the scope of configuration management should be determined, and document owners should be established, for each of these document types. The document owners are responsible for the technical content of assigned documents. The document owners should, also establish priorities for document revision and retrieval.

TFC uses the document control services of Records Information Management to process and maintain documents and records. The document control and records management systems will comply respectively with RPP-PRO-224, *Document Control Program Standards* and RPP-PRO-210, *Records Management Program Standards*.

The types of documents that are controlled are identified in the following primary database systems:

- Hanford Document Control System (HDCS) - Serves as the primary document issuance and change control database for the TFC controlled technical documents, i.e., drawings, specifications, supporting documents, and as prescribed by PRO-224, *Document Control Program Standards*, and RPP-PRO-1819, *Engineering Requirements*. The HDCS is administered and maintained by RIM in 2750E/D166 (376-5555). Documents and revisions/changes are entered into this database at release stations located strategically throughout the site. Access to HDCS database to verify document status is available at each release station. View only access to HDCS by document users at their individual workstations may be arranged through the HDCS administrator at RIM services centers.
- Correspondence Numbering System (CNS) - Is used to assign unique control numbers to official TFC correspondence in accordance with HNF-IP-0842, Volume X, Section 3.3. Individuals generating or receiving official correspondence may directly access this database for control numbers through Software Distribution under System Software & Utilities. Assistance with obtaining numbers through this database is available from Project Hanford Correspondence Control at 825 Jadwid/301 (376-8111).
- Engineering Document Management System (EDMS) - Is used to store and manage the Computer-Aided Drawing data sets for drawings created using AutoCAD in accordance with RPP-PRO-709, Preparation and Control Standards for Engineering Drawings. The system administrator located at 1981 Snyder/122G (376-9077) authorizes direct access to drawings within EDMS. Authorized points of contact within the engineering functions facilitate the retrieval and revision of drawings from their respective electronic storage vaults within EDMS.
- Records Management Information System (RMIS) - Is a document storage and retrieval system used to file copies of documents in image format. Documents are optically scanned and indexed into RIM for easy retrieval. System users are granted View/Print access through the system administrator at 1981 Snyder/214 (372-0728). This system permits easy access and retrieval of controlled documents, significantly reducing distribution, retrieval, and storage costs.
- (Hanford) Site Drawing File (SDF) - Is used by the Project Hanford micrographic services function (RIM) to facilitate distribution of hard-copy drawings and revisions, including master and diazo aperture cards, to specific stations located throughout the site. Information in the SDF database may be viewed by employees using Insight (a reporting tool available on Software Distribution).
- Certified Vendor Information (CVI) Database - Is used to manage vendor information. Information in the CVI database may be viewed by employees using Insight (a reporting tool available on Software Distribution).

3.3.2 Records Information Management

TFC will use RIM services center to receive and transmit documentation and information associated with its mission. The RIM services center will provide a document management and digitizing (electronic imaging) process to help reduce the volume of paper and enable automating and streamlining the business process. The RIM services center will provide the technology and services to manage both incoming and internally created documents, including those discussed in this document, so that information is accessible across TFC and is acted upon quickly and efficiently. This documentation and information process will be defined in procedures and desk instructions.

The RIM services center will provide document scanning, indexing, document release, document clearance, distribution, storage, records disposition and transfer, commitment tracking, and other services as required. The TFC documentation will be stamped and logged as it is processed through the RIM services center. Documents not stamped by RIM services center must be forwarded to a RIM services center for processing. RIM services center will perform a quality control check for TFC-generated documents and make appropriate distribution. The originators of TFC correspondence and documents will obtain letter and document numbers from a RIM services center. A document numbering convention will be developed for documents and information that provides a tie to the WBS. The RIM document and information process flow is delineated in Attachment 5.

3.4 CHANGE CONTROL

The change control process ensures all changes (i.e., scope, technical, schedule, and cost) are properly identified, evaluated, dispositioned, implemented, tested, and documented. Control of changes to the TFC Baseline is delineated in HNF-IP-0842, Volume VIII, Section 1.1. Thresholds for the change categories and the dispositioning change board levels are also delineated in this Baseline Change Control procedure.

This plan incorporates front-end screening of proposed changes to evaluate potential impact to scope, schedule and cost baselines, establishes levels of change control, and integrates the various change control processes. The approval configuration, changes, and departures are contained and tracked in the configuration status accounting system (see Paragraph 3.3 of this plan).

1. **Initiate Change** - Anyone can identify a need for a change. Interfacing processes [i.e., unreviewed safety question (USQ) work management, programmatic change control] often identify the need to prepare a change. A Baseline Change Request Form (change form is identified in HNF-IP-0842, Volume VIII, Section 1.1) is used to initiate scope or programmatic change. This uniquely numbered form identifies the initiator, describes the change accurately, describes the main configuration item and documentation affected, provides a justification for change, describes any programmatic impact (i.e., schedule and

cost), describes interface boundary impact, and lists other information that can be defined by the initiator to assist in describing the change.

2. **Classify Change** -Based on the change assessment, either major or minor, the appropriate level of approval is identified for the change based on a set of predefined criteria. The level of change board membership varies within the major change category. The change board (reference HNF-IP-0842, Volume VIII, Section 1.1) is the final approval authority for major changes. 12HNF-1900 Rev 1 This board identifies the person responsible for directing change planning and implementing the change in all affected parts of the technical baseline.

   — Major Change - Major changes are approved by the change board that includes the cognizant design authority and other impacted groups. Allocation of resources to develop the change package is determined in conjunction with priorities of participants. Change package development may be deferred to coincide with field organization priorities or plant mode conditions.

   — Minor Change -Minor changes are assigned by the engineer or the cognizant manager in accordance with HNF-IP-0842, Volume IV, Section 2.3, "Design Authority Process, Selection and Responsibilities." Change package development may be deferred to coincide with field organization priorities or plant mode conditions.

3. Change Evaluation and Coordination - Changes are reviewed and coordinated in accordance with the Baseline Change Control procedure provisions encompassing the preliminary impact assessments, determining the required change effectivity, identifying associated schedule and cost impact, and providing the appropriate change disposition (approving, disapproving, or deferring pending more information).

4. Revise Affected Documents -Baseline Change Requests are used to implement the proposed change once it is authorized. The Baseline Change Request(s) is developed, reviewed, and the technical accuracy of the details verified. The sequence will vary according to the category of the change. Major and minor changes will be documented before implementation, but the extent will vary. Technical approval of change notices and documentation is determined in accordance with approval designator criteria (see RPP-PRO-233, *Review and Approval of Documents*).

5. Change Implementation -Implementation of the change is authorized through the "Notice to Implement

6. Change Closeout and Verification - Implementation of the change is verified, including testing of physical and procedural changes. Each change should be documented, and that documentation should include a description of the change, as well as an account of the technical reviews, management approvals, as-built information, and post-modification test results. Technical documents that are affected by a change, either directly or indirectly, are work-completed through the ECN process. Closeout of the change is accomplished only

when the technical baseline has been verified as being consistent with the approved change.

3.4.1 Programmatic Change Control

Changes that affect the programmatic baselines of the integrated baseline will be processed and dispositioned in accordance with HNF-IP-0842, Volume VIII, Section 1.1. This procedure applies to changes affecting the lower tier data that roll up to the technical, cost, schedule, and work scope baselines contained within the MYWP. When MYWP changes impact the technical baseline, changes will be implemented in accordance with the technical change control process specified in HNF-IP-0842, Volume IV, Section 4.29, "Engineering Document Change Control Requirements. "

3.4.2 Technical Change Control

This plan describes the TFC technical baseline change control process at a summary level. Changes that affect technical products, processes, SSCs, and associated technical information is integrated with the change process of HNF-IP-0842, Volume VIII, Section 1.1, and implemented in accordance with HNF-IP-0842, Volume IV, Section 4.29.

3.5 CONFIGURATION MANAGEMENT ASSESSMENTS

3.5.1 Programmatic Assessments

The Engineering Configuration and Processes organization and the Quality Assurance organization will perform assessments for compliance to the configuration management established in this plan, and as specified "HNF-SD-MP-SRID-001, *Tank Waste Remediation System Standard/Requirements Identification Document* (Milliken 1999). Assessments will be performed for each configuration management element to determine if the upgraded programs and procedures address identified weaknesses, are effective in accomplishing the configuration management functions, and are workable. Assessments will be planned to determine the strengths and weaknesses of existing configuration management-related processes and procedures with regard to determining where upgrade actions and resources are necessary. Defined metrics (performance indicators) will be used to assess the effectiveness of configuration management implementation. If deficiencies are determined in the implementation of configuration management, then corrective actions and improvement measures will be identified and tracked in the Deficiency Tracking System (HNF-IP-0842, Volume I, Section 2.4, "Corrective Action Management."

3.5.2 Physical Configuration Assessments

Verification that a configuration item's physical attributes (i.e., form, fit, and function) have been met and the product design meeting those attributes has been accurately documented is required to baseline the product configuration. Physical configuration assessments, or

walkdowns, will be performed to determine the degree of agreement between the physical configuration and the configuration depicted in the facility documentation. Physical walkdowns should be included as part of the initial assessments, post-implementation assessments, and periodic effectiveness assessments. If substantive discrepancies (either in number or type) are discovered, appropriate and immediate corrective actions should be developed to establish agreement between the physical configuration and the documentation in accordance with HNF-IP-0842, Volume I, Section 2.4. The corrective actions should include additional walkdowns to characterize the problem and to determine the extent of the problem. They should also include design validation to determine whether the physical configuration or the documentation should be changed. TFC has initiated a drawing and labeling program that is identifying and labeling tank farm equipment and updating the essential drawings of the tank in accordance with HNF-IP-0842, Volume IV, Section 3.13, ‘‘Performing Walkdowns.” This effort can be considered an ongoing configuration system assessment.

3.5.3 Post Implementation Assessments

An SSC within the technical baseline should be tested after modification (and before being placed back in service) to determine if it is capable of meeting its design requirements (i.e., the post-implementation acceptance criteria), in accordance with HNF-IP-0842, Volume IV, Section 4.28, “Testing Practices Requirements.” If a changed SSC fails to meet its post-implementation acceptance criteria, turnover for operation should be postponed until either a technical review has been completed and any follow-up actions are completed or until the SSC is returned to its original condition and tested satisfactorily.

4.0 CONFIGURATION MANAGEMENT ASSET CONTROL

4.1 -ASSET ACQUISITION

The assets of SSCs are acquired to: (1) provide a direct replacement for a failed or otherwise inoperable/unusable SSC, (2) provide a new SSC, or (3) modify an existing SSC in accordance with HNF-IP-0842, Volume V, Section 3.1, “Material Control.”

Direct asset replacement is either replacement with the same make and model, if it is available, or a verified like-for-like replacement. New assets are acquired to establish a new function or service. Modification to an existing SSC includes a direct replacement SSC being used to perform a different function (i.e., this is the same as providing a new SSC). The kind of replacement or acquisition will be determined for each asset.

The process for physical asset acquisition shall be an integrated, systematic approach that shall ensure, but shall not be limited to, consideration of maintainability, operability, life-cycle costs, and configuration integrity in designs and acquisitions.

4.2 OPERATION AND MAINTENANCE OF PHYSICAL ASSETS AND SYSTEMS

Assets and system integrity are required to ensure adherence to the technical baseline. As a minimum, the process for the operation and maintenance of physical assets shall ensure that configuration management will maintain the integrity of physical assets and systems as specified in HNF-IP-0842, Volume IV, Section 5.13, “Procurement of Safety Class Items and Management of Spares.”

5.0 CONFIGURATION MANAGEMENT OF SOFTWARE AND DIGITAL DATA

Software and digital data used for record material, analysis, evaluations, and other functions that support contract, regulatory, mission, or permit adherence shall be controlled configuration management, as identified in RPP-PRO-309, Computer Software Quality Assurance Requirements.

5.1 SOFTWARE AND DIGITAL DATA IDENTIFICATION

Configuration management requires that critical computer software, digital data, and associated documentation be identified and controlled. Computer software, digital data, and associated documentation designated to be controlled will be uniquely identified and established as part of the technical baseline and within the scope of configuration management (see reference RPP-PRO-309).

5.2 SOFTWARE AND DIGITAL DATA CONTROL

Commercially purchased computer software provided for use on the lnternet is provided such control by its specific vendor. Data developed or generated by any computer software must be controlled if it is used for record material, analysis, evaluations, and other functions that support contract, regulatory, mission, or permit adherence (see RPP-PRO-309).

6.0 DESIGN RECONSTITUTION PROGRAM

Design reconstitution is an adjunct program that accomplishes the one-time effort of identifying, retrieving, extracting, evaluating, verifying, validating, and regenerating missing critical design requirements and design bases. Design reconstitution as specified in HNF-SD-WM-CM-011, *Hanford Site Waste Tank Farm Facilities Design Reconstitution Program Plan* (Malinchak 1998), encompasses the following functions: developing associated program plans and procedures; identifying and retrieving design information from identified source documents; evaluating, venfylng, and validating the design information; resolving discrepancies; generating missing critical design information; and preparing and issuing system design descriptions.

7.0 MATERIAL CONDITION AND AGING MANAGEMENT

Material condition and aging management screen components to determine those that are potentially life-limiting, evaluates aging degradation mechanisms, estimating remaining lifetime, evaluating feasibility of continued operations and extended operations, performing detailed material condition and aging analysis, and developing necessary life extension techniques to achieve the desired life. This effort is currently being performed through the engineering process involving the reliability, availability, and maintainability (RAM) analyses as described in the HNF-1947 (Rafaey 1998).

8.0 CONFIGURATION MANAGEMENT PATH FORWARD

Configuration management is applied at the initial planning of a program or project through the execution of that plan. The CHG configuration management requirements will address the identification and control of products, processes, and SSCs and their associated information from the point of conception to their final disposition. TFC will apply configuration management throughout the mission's life cycle, including the integration of the schedule, cost and technical baselines with the technical baseline.

TFC configuration management planning will identify the following actions necessary to implement configuration management in a manner that supports contract provisions.

- Configuration Management Administration - TFC developed and issued the configuration management plan to describe the implementation of the principal configuration management. This plan is established as the standard for the family of projects within the scope of the TFC. Projects may elect to develop a project-specific configuration management plan to address these special needs or they may elect to adopt the HNF-1900 as their standard.
- Configuration management plan - This plan defines TFC-specific configuration management concepts and requirements for the storage, retrieval, and disposal missions. It will assign configuration management responsibilities and assign the infrastructure to control the technical baseline and establish the basis for configuration management integration applied to the TFC. This plan establishes requirements for procedures that will be used for the identification of configuration items. Controls will be established to support the criteria and selection of configuration items and associated technical information, capture of technical information, and placing of configuration items and associated information under change control.
- The TFC-developed, produced or acquired physical items verified through physical walkdowns will ensure that the technical information (e.g., specifications, drawings, and procedures) depicts the actual item's characteristics.
- TFC-managed projects (e.g., W-211, W-314, W-320, W-464, W-465, W-519, as defined by the HNF- SD-WM-SEMP-002,[O'Toole 2000]) will address procedures and actions necessary to effectively implement the configuration management requirements consistent with the plan. The controls established by these projects will be effectively integrated with this parent configuration management plan.

This plan will be an evolving document that will be revised as required to define and improve implementation of the configuration management requirements. It will define program and project interfaces, information systems and activities to be improved, and integrate lower-level configuration management implementation and procedures.

9.0 REFERENCES

Database

HSTD, nd., Hanford Site Technical Baseline Database, database maintained by CH2M HILL Hanford Group, Inc. for Fluor Hanford, Inc., Richland, Washington.

Standards

DOE-STD- 1073-93, 1993, Guide for Operational Configuration Management Systems, Including the Adjunct Programs of Design Reconstitution and Material Condition and Aging Management, U.S. Department of Energy, Washington, D.C.

ANSI/EIA-649, 1998, National Consensus Standard for Configuration Management, American National Standards Institute/Electronics Industries Alliance, Arlington, Virginia.

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DOE 0 430.1A 1998, Life Cycle Asset Management, U.S. Department of Energy, Washington, D.C.

GPG-FM-012, Configuration and Data Management, Life-Cycle Asset Management, Good Practice Guide, U.S. Department of Energy, Washington, D.C.

Policy

RPP-POL-CONFIG, Rev. 0, 1999, Configuration Management Policy, CH2M HILL Hanford Group, Inc., Richland, Washington.

Logic Diagrams

- TWR-2086, RPP Level 0 Logic
- TWR-2087, RPP Retrieval Level 1 Logic Immobilized Waste (1LAW)
- TWR-2088, RPP Retrieval Level 1 Logic Immobilized Waste (1HLW)
- TWR-2089, RPP Retrieval Level 1 Logic Infrastructure Phase 1 Privatization Support
- TWR-2090, RPP Retrieval Level 1 Logic Waste Feed Delivery LAW Feed Batches Tank 241-AN-105
- TWR-2091, RPP Retrieval Level 1 Logic Waste Feed Delivery LAW Feed Batches Tank 241-AN-104
- TWR-2092, RPP Retrieval Level 1 Logic Waste Feed Delivery LAW Feed Batches Tank 241-AW-101

- TWR-2093, RPP Retrieval Level 1 Logic Waste Feed Delivery LAW Feed Batches Tank 241-AN-103
- TWR-2094, RPP Retrieval Level 1 Logic Waste Feed Delivery LAW Feed Batches Tank 241-AP-101
- TWR-2095, RPP Retrieval Level 1 Logic Waste Feed Delivery LAW Feed Batches Tank 241-AY-101
- TWR-2096, RPP Retrieval Level 1 Logic Waste Feed Delivery LAW Feed Batches Tank 241-AN-107
- TWR-2097, RPP Retrieval Level 1 Logic Waste Feed Delivery LAW Feed Batches Tank 241-AN-102
- TWR-2098, RPP Retrieval Level 1 Logic Waste Feed Delivery LAW Feed Batches Tank 241-AN-106
- TWR-2099, RPP Retrieval Level 1 Logic Waste Feed Delivery LAW Feed Batches Tank 241-SY-101
- TWR-2100, RPP Retrieval Level 1 Logic Waste Feed Delivery LAW Feed Batches Tank 241-SY-103
- TWR-2101, RPP Retrieval Level 1Logic Waste Feed Delivery HL W Feed Batches Tank 241-AZ-101
- TWR-2102, RPP Retrieval Level 1 Logic Waste Feed Delivery HLW Feed Batches Tank 241-AZ-102
- TWR-2103, RPP Retrieval Level 1 Logic Waste Feed Delivery HL W Feed Batches Tank 241-AY-102
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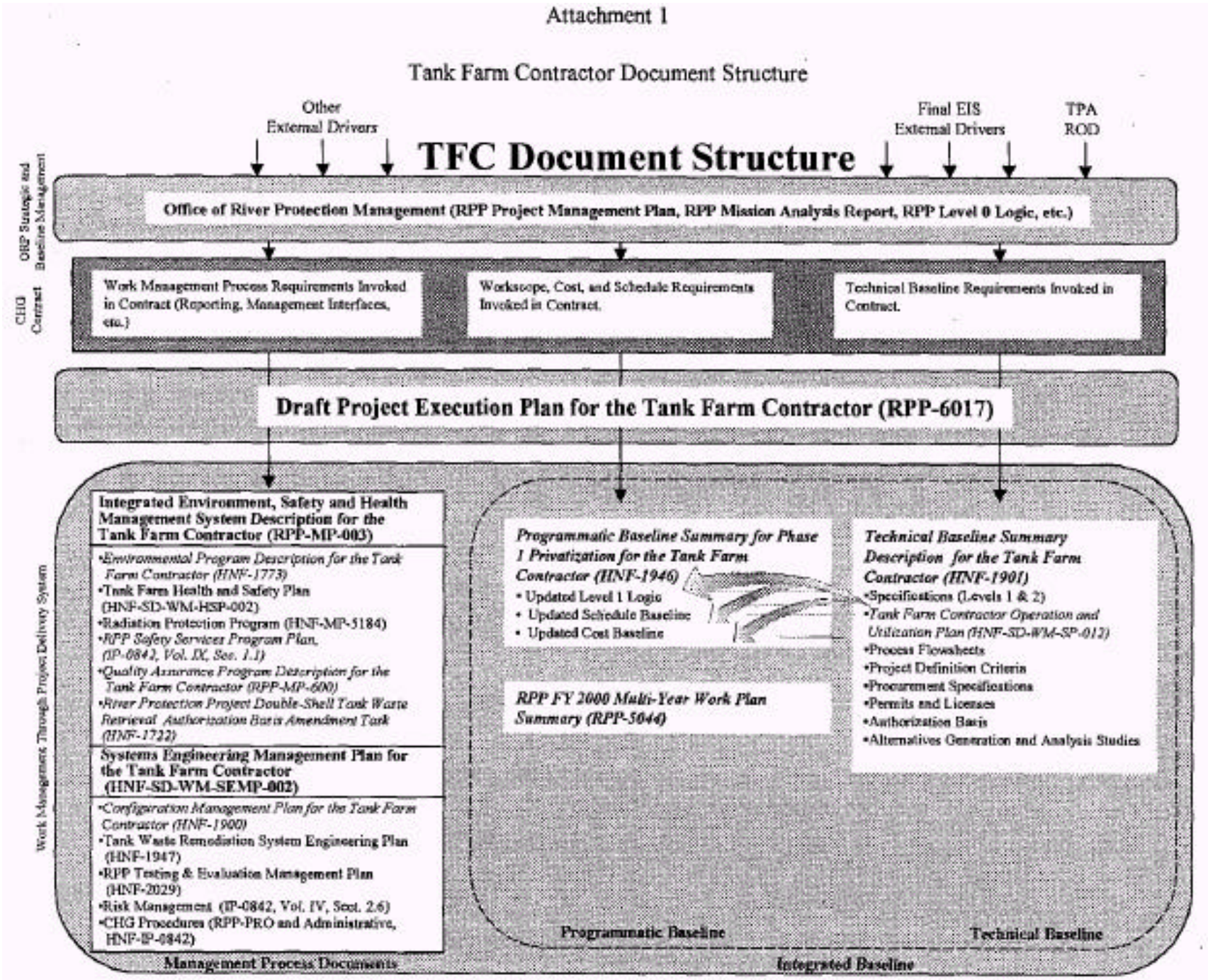
Attachment 1

Tank Farm Contractor Document Structure



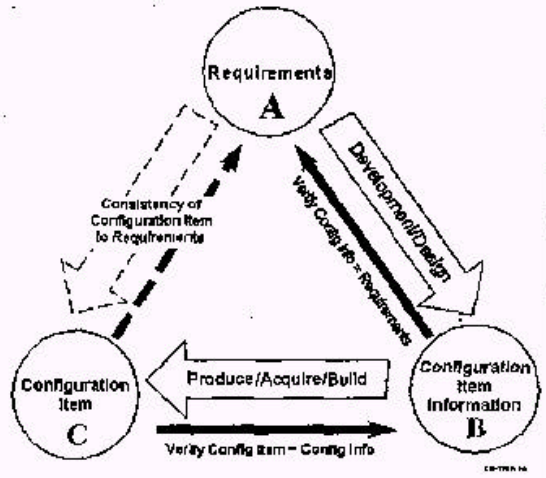
Appendix 2

The Configuration Management Triangle

In the process of developing or designing a CI (e.g., SSC, document, or digital information), sources of requirements (A) are identified and the requirements are interpreted to develop a set of information (B) that defines and supports the CI. Then that information is used to CI, acquire, or build the CI (C) and operate, maintain, and support it. (In many instances a CI can lead to other source requirements or CI information for other products.)

Compliance of the product to requirements is ensured by maintaining traceability and consistency between the requirements, CI information, and CI. When the CI information is developed, its compliance to the requirements *is verified (small B-A arrow).* When it is created or acquired, the CI=s compliance to the CI information is verified (small C-B arrow). The CI must comply with the requirements and if either the CI or requirements changes, procedures will be activated to bring them in compliance with each other.

This relationship is maintained for the life cycle of the CI Change to requirements (A), CI information (B), or CI (C) requires that they each be examined for impacts to ensure that compliance and traceability is maintained.



EXAMPLES:

A - Requirements	B – CI Information	C – CI
• Contracts • DOE orders • Federal regs. & codes • Mission • NEPA Record of Decision • Tri-Party Agreement • S/RID • External ICDs and MOAs	• Design dwgs., as-built dwgs. • Specifications • Procedures • Authorization Basis • Calculations • Tech., sched, & cost bases • Reviews and assessments • Interface Control Documents • Functions and requirements • Labeling • Plans and procedures • Design concepts • Research • Assumptions, risk analysis	• RPP MYWP • Physical systems • Structures, systems components (SSC) • Performance measures • Vendor information • Spares • Operations and Maintenance procedures • Test evaluations • Deliverables • Permits • Equipment history • Data

CI = Configuration Item

ICD = Interface Control Document.

MYWP = Multi-Year Work Plan.

NEPA = National Environmental Policy Act of 1969.

S/RID = Standards/Requirements Identification Document.

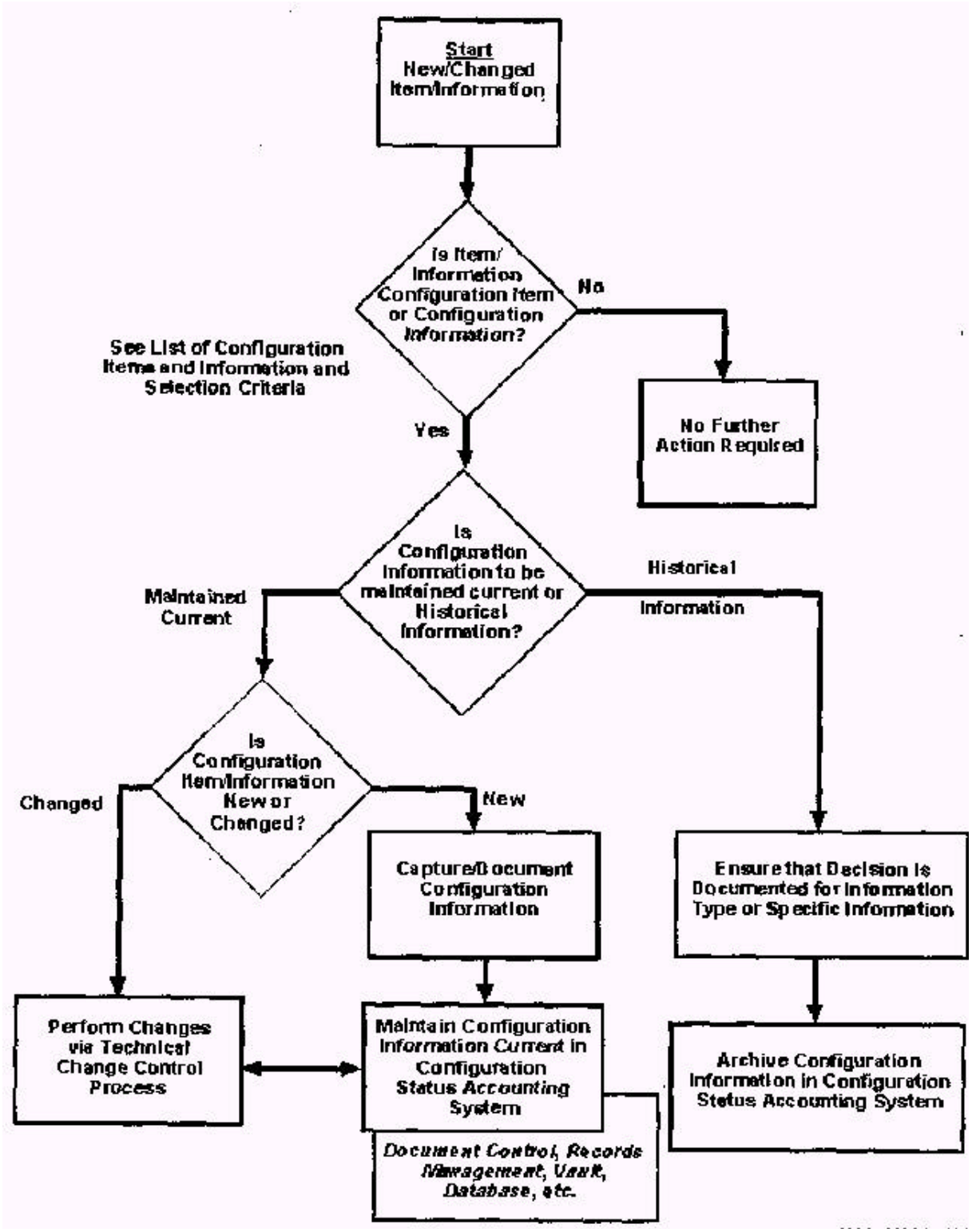
SSC =structures, systems, and components.

Tri-Party Agreement = Hanford Federal Facility Agreement and Consent Order.

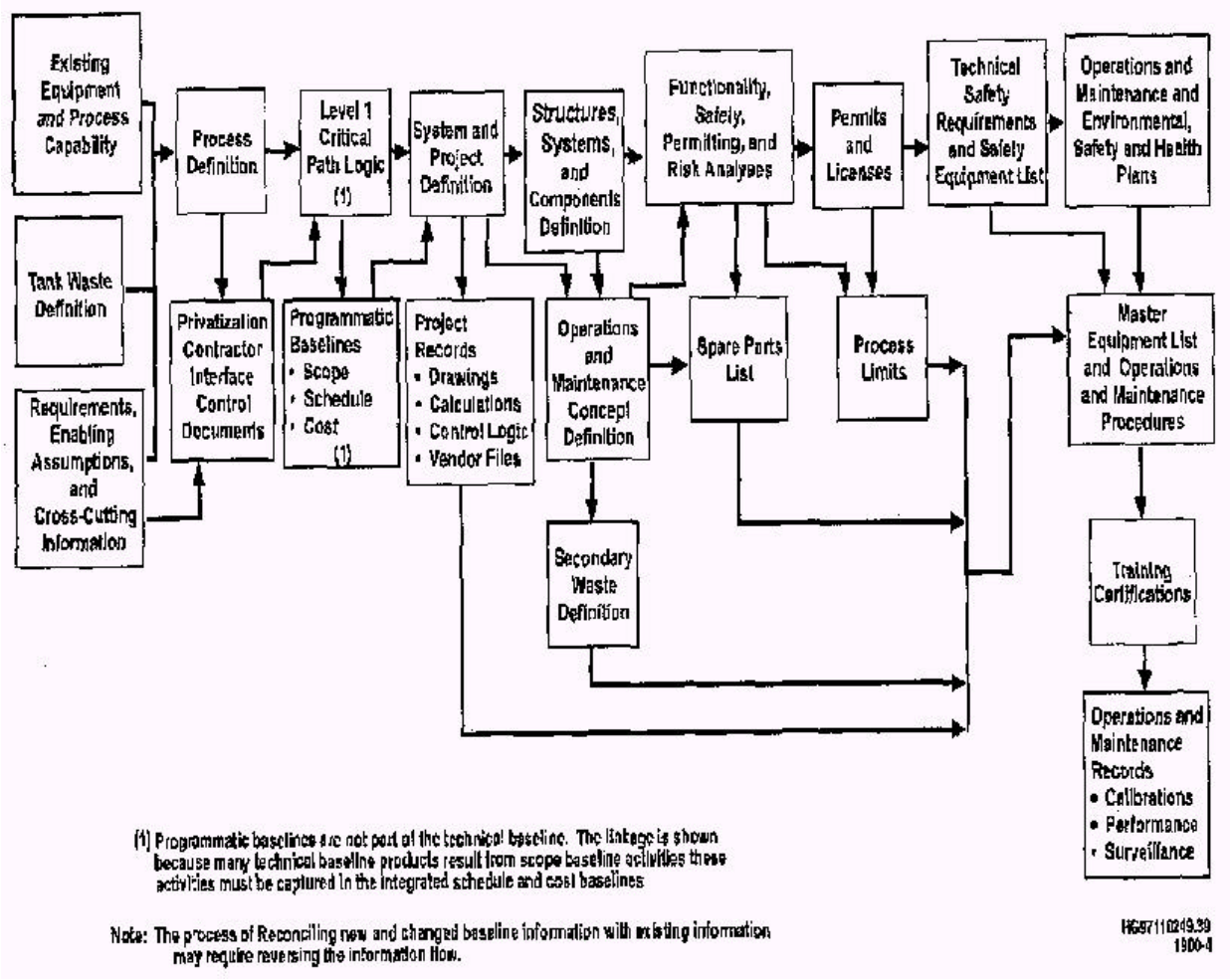
RPP = River Protection Project.

MOA = Memorandum of Agreement

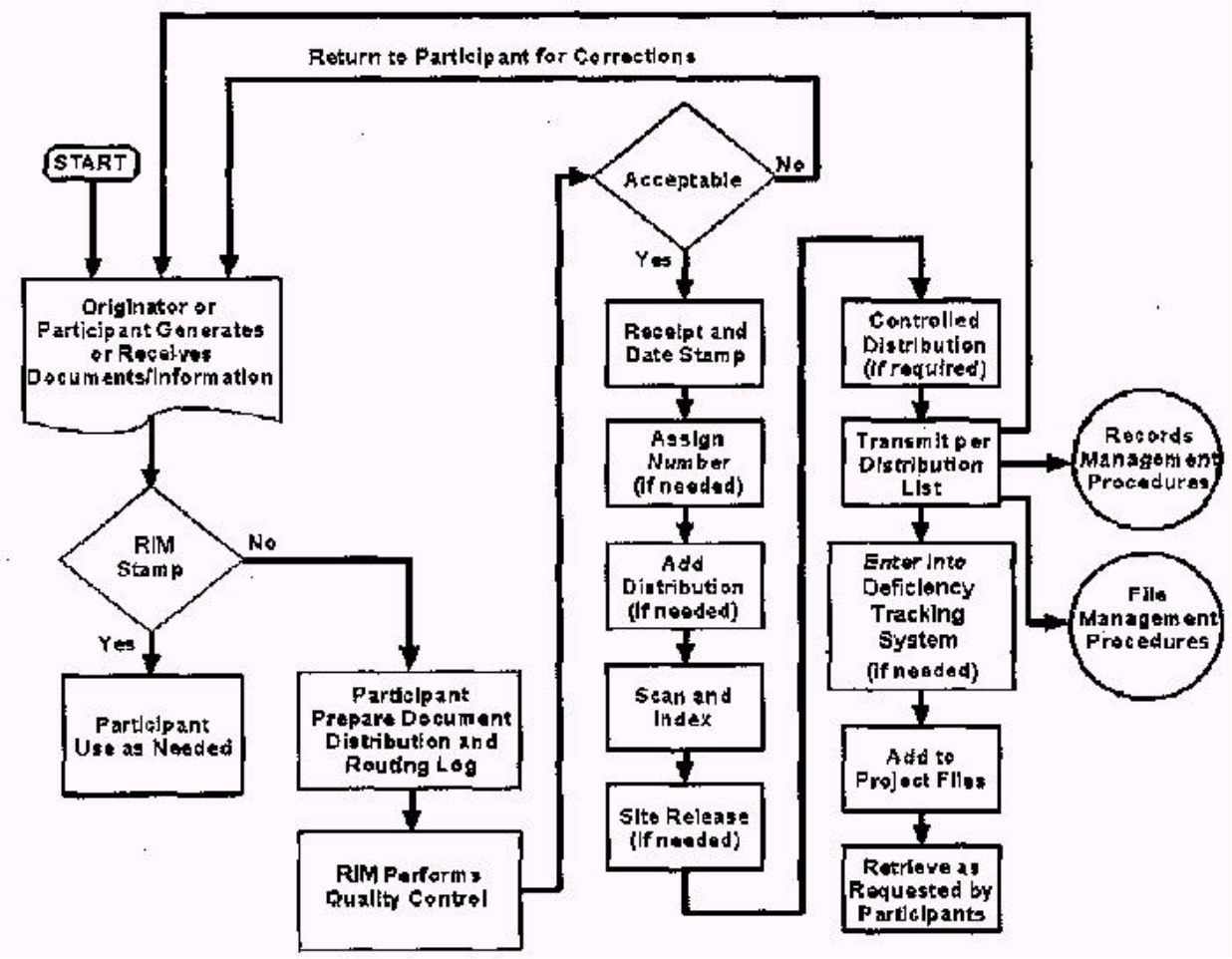
Appendix 3
Configuration Management Application



Appendix 4
Technical Baseline Information Flow Process



Appencix 5
TFC Records and Information Management Services Flow Process



RIM = Records and Information Management Service Center

ATTACHMENT 3. SAMPLE REFERENCE

Configuration Identification

1. GENERAL

The sites, facilities, structures, systems and components important to the environment, safety, and health and other SSCs that are deemed critical to the mission should be included in the configuration management program. Unique identifiers should be used in all phases of programs, projects, and operating facilities to ensure documentation can be assembled for the sites, facilities, SSCs as required.

2. GUIDELINES

2.1 Identification of Physical Items

The process for configuration identification of physical items includes:

- The criteria and scope for the physical items to be included in configuration management to be defined.
- Facilities and structures to be uniquely identified.
- The identification of systems, system boundaries, and system interfaces to be clearly delineated and the systems uniquely identified.
- Major components of systems to be uniquely identified by a function code.
- The unique identifier consist of the system, function code, and address to uniquely identify the component and location within a system.
- The location (address) of components within the system to be assigned and shown on drawings.
- Labels to be attached to the physical items showing the unique identifier.
- Documentation generated throughout the life of programs and projects reference the unique identifiers.

2.2 Identification of Structures and Systems

The boundaries and interfaces for each structure and system should be clearly described and documented. These bounded structures and systems should be uniquely identified.

The unique identifiers assigned to the structures and systems should be used throughout the life of the project or operating facility for identification of the structures and systems.

2.3 Identification of Components

Components within systems should be uniquely identified as follows:

- A controlled list of function codes should be developed and maintained current at each project or operating facility.
- Each component requiring unique identification should be assigned a function code from the controlled list of function codes depending on the primary function the component performs. (For example, a valve might have a controlled function code of VLV from the controlled function code list.)
- The component should be assigned an arbitrary numeric address depicting the relative position of the component in the system to other components. This relative location assignment for the component is called the "address" of the component.
- The unique identifier for a component should consist of the system identifier, the component function code and the component address.
- The unique identifier should be depicted on design drawings.
- The components should have a label affixed to show the unique identifier when possible. Labeling should comply with the requirements of DOE 5480.19, Chapter XVIII, Equipment and Piping Labeling.

Guidelines for determining the level to which individual components should be uniquely identified are given in Table B-1.

Table B-1. Level of Unique Identification of Components.

The level to which components are uniquely identified can be determined using the following guidelines:

A. The component is at a level of assembly to allow ready access to decision information.

B. The component is at a level at which change incorporation and configuration verification is required and documented.

C. The component provides the basis for preparation of operating and maintenance manuals.

D. The component requires visibility and control because of its high cost, criticality in the system, or contractual/acceptance significance.

E. The component does not contain a subassembly requiring independent change incorporation and configuration verification.

2.4 Identification of Additional Components and Subcomponents

Design changes may result in the requirement for additional components to be added to a system. These components should be assigned the appropriate function code and the correct address relative to other components and should be included on design drawings and be labeled. When desirable or required to identify subcomponents of a component, the function code for the subcomponent should be selected depending on the function of the subcomponent and the address should be the same as the component.

2.5 Identification of Assembled Packaged Equipment or Skid-Mounted Equipment

If the components would have required identification in an engineered system, the components of assembled packaged equipment or skid-mounted equipment should have the components identified. These unique identifiers should be shown on drawings and should be labeled.

2.6 Identification of Software

Software configuration items are those computer codes that directly control processes important to operations or specify design output or are used to refine design input for a configuration item. Software subject to the configuration management program should be uniquely identified as a configuration item. Unique identification of software requires:

- General description and primary purpose.
- Version, release number, and level.
- Unique identifiers for each program; traceable from source listings/object modules to the codes output.
- Version and revision number and date, traceable from source listings/object module to the codes output.
- Cross reference to unique configuration item(s), if applicable.
- Cross references to the codes supporting documentation, including requirements and design specifications and user/operations manuals at the same version/revision level, as applicable.

2.7 Identification of Waste Characterization Data and Samples

Waste characterization data to be used as design or process input should be included in the configuration management program. Waste characterization requires full sample traceability and accountability. The waste characterization data and samples should be uniquely identified. This requires:

- Use of separate, unique identifiers for multiple, discrete samples.
- Identification of the individual items or portions resulting from subdivision that are readily traceable to the original sample.

- Traceability of samples to applicable documentation and documentation to applicable samples by the unique identifier.
- Traceability of samples to their origin including site location and orientation.
- Use of labels (bar codes) or other methods of identification to show the unique identifier during processing.
- Maintenance of controlled site location maps for identifying sample locations.

2.8 Identification of Waste Packages

All waste packages should be included in the configuration management program. Waste packages should be uniquely identified to ensure accountability and traceability as follows:

- A unique identifier should be assigned to each waste package.
- Labels or other methods of identification of the unique identifier should be provided for each package and applied in a manner not to compromise the integrity of the waste package.
- The unique identifier should be legible at least to the end of the period of retrievability.
- Waste package documentation should be retrievable by the unique identifier.

2.9 Identification of Documentation

Documentation associated with configuration items should be included in the configuration management program to ensure traceability of requirements and retrievability of information. Documentation associated with configuration items should be uniquely identified to ensure traceability and retrievability as follows:

- A standard numbering system for the generic baseline document types such as drawings, procedures, calculations, etc., should be established and used throughout the life of the program, project or operating facility.
- The standard numbering system should provide for unique identification and cross-referencing of all mutually dependent documents.
- The standard numbering system should be procedurally controlled.
- The unique document identifier along with the revision level and effective date
- should be clearly identified on each issue of a document.
- Documents supplied by vendors should either conform with the required numbering system, or have a numbering system that is judged sufficient, used consistently by the vendor, and provides for retrievability of documentation.

ATTACHMENT 4

SAMPLE - Data Management

1. GENERAL

Computerized information systems should be used as tools to monitor configuration management technical baseline information and changes thereto. The configuration management related data bases should include an index of all configuration items and documents representing technical baseline information, an index of all proposed and approved changes to the technical baseline, and the status of the changes thereto. When used, these information systems become extremely important to the permitting, licensing and operations of projects and operating facilities. Configuration management computer applications along with the technical database and the records management computer applications contain a substantial portion of the information necessary to substantiate full regulatory compliance.

The integration of these data bases and the controlled and rigorous data management techniques used in the design of the computer applications supporting configuration management should meet the requirements of the approved configuration management program

2. DEFINITIONS

Computer Hardware, Software, and Resources. The equipment, computer programs, and information systems professionals that collectively make up the information resource management function to be utilized for development of systems that enhance the management and control functions of programs, projects and operating facilities in order to meet the goals and objectives of the Mission.

Sponsor. The organization with direct contact to the information resource management organization that (1) identifies requirements for a specific computer software application; (2) supports development, implementation, and utilization of the specific computer application; (3) budgets resources and supports procurement of information resources related to the computer software application; (4) sets priorities and long range direction for the computer software application; and (5) develops service-level requirements as they relate to the computer software application.

User Group. A formal group established to review, approve and provide priorities for development and maintenance of information systems supporting configuration management

with members from affected and interested organizations to include, but not limited to, information systems.

3. ROLES

3.1 Program Office

The Program Office directors should:

- Provide requirements for computer hardware, software, and information resource management resources as they relate to the configuration management program.
- Support design, development, implementation, and utilization of computer hardware, software, and resources for the configuration management program.
- Recommend changes to other related procedures as those procedures impact the computer hardware, software, and resources that relate to the management and control of configuration management baselines and changes thereto.
- Act as sponsor for configuration management computer applications at the Program Office level.
- Establish and chair an Program Office configuration management computer applications user group.
- Provide long-range plans for information systems as they relate to configuration management systems.
- Ensure that proper records are developed documenting all approved changes to information systems.

3.2 Field Elements

Field Elements should:

- Establish configuration management software applications and support activities that meet the intent of this procedure.
- Provide short- and long-range configuration management computer hardware, software, and resource requirements to the appropriate Field Element organization responsible for information systems.
- Identify all configuration management computer applications used in the organization with identification of the software scope, sponsoring organization, input requirements, and output provided. This information is utilized to enhance the integration of computer software and help to reduce the proliferation of disconnected and inefficient computer applications.
- Review and approving specifications for configuration management computer applications.

- Identify training requirements for their organizations as they relate to configuration management software applications.

4. GUIDELINES

4.1 Development of Configuration Management Applications

The following guidelines apply to the development of configuration management applications.

- Joint development with affected and implementing organizations of configuration management software applications should be required in order that the goals and objectives of the configuration management program are effectively and efficiently met.
- Purchased software and hardware components should be utilized whenever feasible and practical.
- Extensive use of prototyping should be provided by the software developer to ensure requirements are met effectively and efficiently prior to final delivery of a detailed design.
- Service levels should be developed for on-line response times, batch report turnaround, error resolution, minor changes, and other service levels as considered important to the operation and use of the configuration management applications.
- Development of appropriate documentation, including a user manual, should be required prior to implementation and acceptance of developed or acquired applications.
- An operational user group should be established to review, approve, and prioritize enhancements to the software application once implemented.

4.2 Operations and Maintenance of the Configuration Management Systems

Maintenance of configuration management software applications should be treated commensurate with the original development techniques. Authorization for minor changes that include only output format changes or correction of minor software errors should be at the discretion of the information services organization; however, all normal documentation, testing, and training should continue to be required. All major changes and corrections should be reviewed by the user group for approval and priority ranking.

Operational requirements for configuration management software applications include data verification techniques, reporting requirements, and data discrepancy reporting.

The following guidelines apply to operation and maintenance of configuration management software applications.

- Data entered into the configuration management computer applications should be independently verified. Data errors should be reported when detected.

- Project personnel should be provided tools to design, develop, and generate the maximum amount of reporting possible, minimizing the impact to information services personnel.

4.3 Configuration Management Systems Integration

The successful implementation of the configuration management program depends heavily on the ability to retrieve information using many different data attributes as key information. The traceability of information is of paramount importance in baseline control and ensuring that technical information is up to date and accurate. Configuration management actively supports the elimination of uncontrolled and redundant data, and the integration of data when feasible and cost effective. The following guidelines relate to the integration of configuration management information.

- Data management techniques should be employed in the design, development, and implementation of all data bases directly or indirectly supporting configuration management.
- Configuration management related data stored on stand-alone data bases is to be identified and scheduled for integration in a planned approach and with minimum disruption.
- Regular inventories of hardware and software should be made to determine the existence and extent of uncontrolled redundancies, and reports should be presented to the configuration management software applications users group with recommendations on integration.
- A value-added approach for incorporation of redundant and/or related data bases should be made.
- Technologies that support the elimination and efficient and effective use of configuration management related data should be evaluated and employed where cost effective.
- The computerization of configuration management information should be considered where it is cost justified and the impact to ongoing applications is minimized.

ATTACHMENT 5

Software Configuration Management

1. GENERAL

The configuration management program should ensure that essential and critical computer software is identified and controlled. Software that is to be controlled through the configuration control process should be uniquely identified and established as part of the technical baseline.

2. ROLES

2.1 Program and Field Element Secretariat Organizations

Program Office and Field Element Secretariat organizations should be responsible for providing an index of all software configuration items (SCIs), including changes and the status for use.

2.2 Field Elements

Field Elements should be responsible for:

- Establishing and maintaining procedures to control SCIs within their organizations.
- Utilizing an index for SCIs with appropriate cross-references to related information, including proposed and approved changes with status information.
- Developing a systems requirements specification for all SCIs either existing, acquired, or to be developed.
- Controlling the SCI codes and documentation throughout the software life-cycle to include controlled distribution of appropriate documentation.
- Retesting SCIs when related/involved software and hardware (operating systems, run-time routines, interpreters, microcode, input devices and others as appropriate) changes are made that have potential impact on the output of the SCI.
- Establishing a discrepancy reporting and corrective action system.
- Establishing independent reviews and approvals for developed or acquired software at major points in the development or operations life cycles per quality assurance guidelines for independent reviews.
- Maintaining a log of all uses of SCIs to ensure traceability in the event of error detection.

3. GUIDELINES

3.1 Development and Acquisition of Software Configuration Items

The following guidelines apply to the development and acquisition of software configuration items:

- Prior to development or acquisition of an SCI, a systems requirements specification should be developed identifying the basis for source code development, functional requirements, data interface requirements, hardware requirements, mathematical models, assumptions for use and any other pertinent information appropriate to the pre-design phase.
- In conjunction with the development of the systems requirements specification, a software quality assurance plan should be developed. The software quality assurance plan should identify all quality assurance measures and techniques to be used in qualifying the software for use, to include software development project organization structure, design methodology, coding standards and conventions, configuration control measures, automated tools to be used for development and testing (if applicable), hardware considerations, independent review techniques, training for project team leads and programming personnel, security considerations, and other information appropriate to the development of software quality assurance.
- The system requirements specification should be independently reviewed and approved prior to CCB submission. When the independent review is completed, the system requirements specification should be submitted to the appropriate CCB for approval. For in-house development no additional phases of work should be completed until the CCB has approved the system requirements specification.
- The source code should be independently reviewed and approved when completed. This review should be documented program by program.
- A software verification and validation plan should be created in conjunction with the detailed design phase. The software verification and validation plan should address all controls to ensure that the requirements are captured in the design and that the design meets all criteria.
- The software should be independently tested to determine that it meets the original requirements and design specifications (verification).
- The software should be independently reviewed to determine that the output is correctly computed and produces results consistently (validation) under varying assumptions to be used once the software is placed into production.
- The results of the verification and validation phases should be formally documented in the software verification and validation report. The test data should be saved and used in order

to requalify the code in the event of changes to the source code and related software and hardware.

- Organizations inputting data into the system should be responsible for the accuracy and completeness of the data. Error messages and warnings generated by the code should be thoroughly researched prior to using the results.
- Development of appropriate documentation, including a users manual, should be required prior to implementation and acceptance of developed or acquired software.
- Contractors performing configuration management software development work should be formally assessed as to relevant experience and qualifications.
- A record of the use of all output should be maintained in the event that errors are discovered at some later point in time. A notification mechanism should be established to report the consequences of errors and their potential impact on uses of the software output.

3.2 Operations and Maintenance of Software Configuration Items - Change Control

Maintenance of SCIs should be treated commensurate with original development. Authorization for minor changes that include only output format changes or correction of minor software errors should be at the discretion of the software sponsor; however, all normal documentation, testing and training should continue to be required. All major changes and corrections should be reviewed by the CCB for approval. The following guidelines apply to operation and maintenance of software configuration items:

- All proposed changes to SCIs should be documented and presented to the appropriate CCB.
- The proposed change should be identified in the appropriate data management system.
- Upon change approval the data management system should be updated to reflect the new status. Likewise, should the change be unapproved or held, the data management system should be updated to reflect this change in status.
- Changes should be evaluated to determine the acceptability of using results from previous revisions of the software. Where it is determined that the results produced by previous revisions of the software may result in an unacceptable output, all users of the previous revision should be notified of the changes and acknowledge that the results obtained from prior revisions do or do not materially affect their work.
- The change should be developed, tested, and implemented in accordance with approved procedures.
- Upon implementation of the change, all appropriate documentation should be updated. This documentation includes as a minimum the Users Manual and the updated systems requirements specification.

- The output generated by the software should identify the current version and revision of the software and the effective date of the revision.
- Training should be conducted and training records maintained to attest to such training, where appropriate.

3.3 Discrepancy Reporting and Error Notification

Traceability of use of design input or output is critical to safety. Discrepancy reporting provides a necessary feedback loop in the process to ensure that all errors are reported, users are notified of the situation, and as a result are able to adjust to the correct information. The following guidelines are related to discrepancy reporting and error notification.

- All uses of SCIs should be documented with the date and time of the use and the version of the SCI in effect at the time.
- Should an error in the SCI or related software be discovered, immediate notification is required using the standard methods of discrepancy reporting.
- Once the magnitude of the error is known, all previous users of the software should be notified in writing and requested to determine the impact of the error on their previous use of the software.
- Corrections to the software and root cause analysis should be immediately undertaken.

ATTACHMENT 6

Document Control for Configuration Management

1. GENERAL

Documents should be controlled and distributed to ensure that only the applicable approved version is available for use and to ensure prompt communication of changes. The effective control of documents is essential to the success of the configuration management program because the documents are the vehicles used to communicate information to affected organizations. The configuration management program should ensure processes are in place such that:

- Controlled documents are uniquely identified and identification systems are proceduralized.
- Controlled documents are reviewed, approved, changed, and released through change control processes.
- Controlled documents are kept current by controlled distribution, including a receipt acknowledgment process.
- Users needing controlled copies have ready access to current revisions of controlled copies.
- Databases providing revision level information are controlled and maintained current.
- Record retrieval systems are in place that allow timely retrieval of historical documents and the cross-referenced material in those documents.
- Effective dates are established for controlled documents that allow for changes to impacted documents and related training.

All technical baseline documents should be issued as controlled documents. On approval, these documents should be entered in the appropriate controlled document list.

2. DEFINITIONS

Controlled Copy. A document that is maintained on a current basis by means of a revision control process and a formal transmittal/receipt acknowledgment system.

Controlled Document. A document that is prepared, reviewed, revised, and approved in accordance with established procedures, has controlled distribution, and is maintained on a current basis.

Controlled Documents List. A list of the documents to be controlled. This list includes information such as document number, title, revision number and date, effective date, and originating and distributing organization.

Distributing Organization. That organization responsible for reproduction, distribution, and transmittal receipt/acknowledge of controlled documents.

Document. Any written or pictorial information describing, defining, specifying, reporting, or certifying activities, requirements, procedures, or results.

Originating Organization. That organization responsible for preparing, revising, reviewing, approving, completing, or statusing a document and releasing it to the appropriate organization for distribution.

Standard Distribution List. A list for each controlled document identifying the recipient's position, location, and controlled copy number.

3. ROLES

3.1 Program Office and Field Elements

The Program Office and Field Element directors and/or managers should:

- Approve the Standard Distribution List for the controlled documents within their areas of responsibility.
- Generate and distribute a Controlled Document List.
- Ensure only current revisions of controlled documents are used in performing quality-related work activities.

3.2 Document Originating Organizations

Controlled document originating organizations should:

- Ensure controlled documents released for distribution have been appropriately reviewed for technical adequacy and approval.
- Ensure effective dates for controlled documents are established prior to release for distribution.

3.3 Document Distributing Organizations

Controlled document distributing organizations should be responsible for ensuring controlled documents are distributed in accordance with approved procedures.

4. GUIDELINES

4.1 Document Generation

Organizations that generate documents, which are under the scope of this attachment, procedurally should define the process for the preparation, format, review, approval, revision, and verification of the technical adequacy of those documents.

4.2 Document Identification

4.2.1 Document Numbering

- Each controlled document should be identified by a unique number that appears on all pages of the document. The original identification number should be retained throughout all changes to and revisions of the document. Should a document be canceled, that unique number should not be reused.
- The current revision number of each controlled document should appear on all changed pages issued since initial issuance of or last complete revision.
- Pages within a controlled document should be numbered in a manner that allows page accountability.

4.2.2 Control Identification

Controlled documents should be clearly identified as controlled by use of colored paper or a color-identified stamp indicating a "controlled" status. Black should not be an acceptable color identification for the control stamp. Without this control identification, documents *should be considered uncontrolled.*

4.2.3 Controlled Documents List

A Controlled Documents List should be maintained which identifies controlled documents originated by their organizations and lists the individual document title and number, the current revision number and date, effective date, and originating and distributing organizations.

4.3 Document Revisions

- Revisions to controlled documents should be reviewed and approved by the same organizations that reviewed and approved the original issue, unless delegated to another qualified organization.
- Inclusion of revision/change information should be made part of the document by one of the methods listed below:
  - — Inclusion of a revision/change record as part of the transmittal package;
  - — Inclusion of a revision/change log as part of the document.

- The revision/change information should include the reason for the revision and identify the page(s) revised.

4.4 Document Review

Organizations originating controlled documents should procedurally define the required review and approval cycles. Resolution of review comments, for which resolution is considered mandatory by the responsible organization, prior to approval should be documented.

4.5 Document Release

- Organizations originating controlled documents should be responsible for ensuring controlled documents are legible, reproducible, adequately reviewed, and appropriately approved prior to release for distribution. An effective date for the controlled document should be indicated on the first page of the controlled document, allowing sufficient time for the development/revision of implementing procedures and training as appropriate.
- When the revised document is maintained in a manual, an updated table of contents or an index should be prepared which accompanies the revision that is forwarded to the distributing organization.

4.6 Document Distribution

- A unique controlled copy number should be assigned to each controlled document listed on the Standard Distribution List.
- A systematic transmittal and receipt acknowledgment process should be used to control distribution and track receipt of controlled documents. Individually addressed transmittals should be used to transmit controlled copies of documents to each person on the Standard Distribution List. The transmittal record should also contain any necessary instructions, including the deadline for return of the signed transmittal receipt and disposition instructions for superseded documents/pages.
- The recipient of each controlled copy should sign and return the transmittal to the distributing organization by the due date specified and maintain his/her controlled copy current.

4.7 Standard Distribution List

Standard distribution lists should be developed for controlled documents, and maintained by the organization distributing controlled documents. Additions to or deletions from the standard distribution lists should be authorized by the organization originating the documents. Controlled distribution should be limited to avoid the creation of an unduly cumbersome or unmanageable document control system that may ultimately be self-defeating.

4.8 Document Use

It is the responsibility of the user to ensure that only the current revision of controlled documents are used in the conduct of activities. Currency should be readily verifiable by contacting the distributing organization or reference to the Controlled Document List.

4.9 Document Assessment

At least annually, each distributing organization should require each controlled copy holder to inventory and verify currency of all controlled copies assigned to the particular position. Random assessments of controlled copies should be made by the distributing organizations to confirm the adequacy of the controlled distribution process on an as needed basis.

4.10 Maintenance of Controlled Copies

4.10.1 Master Copy

A master copy is the copy used by distributing organizations for reproduction, distribution, and reference of the current revision. The master copy should not be checked out of the distributing organization's files and access control should be maintained. Only the current revision should be considered a master copy. Historical, superseded, or obsolete revisions should be maintained in the appropriate records systems.

4.10.2 Controlled Copies

Recipients of each controlled copy should maintain that controlled copy current, promptly inform the distributing organization of any changes in physical relocation, position responsibilities, or titles, and at least annually assess the accuracy of their controlled copy(ies).

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ATTACHMENT 7. SAMPLE FORMS

Department of Energy Baseline Change Proposal			
1) BCP Number:	2) BCP Title:		
3) Line Item Number:	4) Project Title: Category: Subproject Title and No: Type:		
5) Date Received at Secretariat: Level 2 _____ Level 1 _____ Level 0 _____			
10) BCP Originator: Routine [ ] Priority [ ]* Emergency [ ]* * Justify in Blk. 19	7) BCP Level: Level-0 [ ] Level-1 [ ] Level-2 [ ]	8) Directed Change: Yes [ ] No [ ]	9) SOPR:
10) BCP Originator:	11) Phone:	12) FAX:	13) Location:
14) DOE Site POC:	15) Phone:	16) FAX:	17) Location:
18) Change Description to Scope, Schedule and Cost (Use continuation sheet if necessary):			
19) Change Justification and Impact (If Directed Change, specify authority and attach document):			

Department of Energy
Baseline Change Proposal

20) BPC Number:

21) Impact on Cost Baseline:	Approved Baseline	Change	Proposed
Total Estimated Cost (TEC)	$	$	$
Total Project Cost (TPC)	$	$	$
22) Current Contingency:	CPDS	Change	Proposed
	$	$	$

23) Impact on Funding Profile (TEC + OPC = TPC):
Fiscal Year

	Approved CPDS		Proposed Change		Annual Changes*		Proposed Profile	
	Capital	Operating	Capital	Operating	Capital	Operating	Capital	Operating
Prior Years								
Current Year ____								
Budget Year _____								
BY + 1								
BY + 1								
BY + 1								
BY + 1								
Out Years								
Subtotal								
Total (TPC)								

* Include the sum of only those changes approved since the last congressionally approved CPDS to show the total impact (shown in the last two columns) on the current CPDS.

24) Funding Source for TEC/OPC Increases:

25) Impact on Schedule Baseline:

Milestone	Baseline (Month/Year)	Proposed (Month/Year)	Change

Department of Energy
Baseline Change Proposal

26) BCP Number:

27) Impact on Scope Baseline:

Item	Baseline	Revised

28) Other Impacts (Health, Safety, Environment, Tiger Team, DNFSB, etc.)

29) Interim or Corrective Actions:

Baseline Change Proposal: INSTRUCTIONS

The Baseline Change Proposal (BCP) documents the impact of proposed baseline changes on scope, schedule, and cost baselines. BCPs require disposition from a BCC board and should be used for changes to Strategic Systems and other projects that exceed approved baseline limits. The BCP should be a standalone document that concisely describes and justifies the change and the resulting impact on baselines. Back-up documentation should be attached except for DOE directives, which may be referenced.

1. BCP Number. Assigned by the Operations Office to identify the change proposal. Typically assigned when entered into the field's baseline change control project log.

2. BCP Title. A brief descriptive statement identifying the change.

3. Line Item Number. The line item project number in the budget. *Example: The line item project number for the combined device assembly facility is 85- D-105.*

4. Project Title. The project title on the Construction Project Data Sheet (CPDS) or Activity Data Sheet (ADS). Also include the project type (OPEX, GPP, etc.).

   Subproject Number and Title. Where applicable, state the subproject number and title within the project. Example: S-2899 Airborne Radiation Removal. This is a subproject of the Productivity Retention Program.

5. Date Received at Secretariat. The date that the completed BCP form was received for processing at each level.

6. Change Designation. Either "routine," "priority," or "immediate" processing. Include in block 19 if using a designation other than "routine."

   Immediate Change. Required in emergencies to prevent a life-threatening situation. Alerts the appropriate BCC board chairperson of an action the field office plans to implement to prevent a catastrophic situation from developing.

   Priority Change. Required in response to a directed change or to correct any potentially hazardous condition, possible injury of personnel, immediate damage to plant/equipment, or significant cost reductions.

   Routine Change. All discretionary changes.

7. BCP Level. The highest level of authority required to provide disposition of the change proposal. Approval authority is determined by thresholds established for each project.

8. Directed Change. “Yes” if the change is a directed change. “No” if it is not a directed change. Directed changes are imposed on the project with direction to implement, such as changes imposed by budgets, funding, policy, or regulations.

   The BCC board chairperson may not have the authority to disapprove a directed change but is to review the implementation method and resulting baseline impact.

9. Secretarial Officer with Program Responsibility. The Program Office that has project oversight (e.g., Defense Programs, Energy Research, etc.).

10. BCP Originator. The individual responsible for preparation of a change proposal.

11. Phone. The BCP originator’s phone number. Include area code.

12. FAX. The BCP originator's FAX number. Include area code.

13. Location. The BCP originator’s site and office (e.g., SRP/PMD).

14. Site Point of Contact (POC). The contact at the site where the BCP originated. This individual may be contacted to clarify or submit additional information.

15. Phone. The site POC's phone number. Include area code.

16. FAX. The site POC's FAX number. Include area code.

17. Location. The site POC's location, site and office (for example, SR/PMD).

18. Change Description to Scope, Schedule, and Cost. A thorough description of the change to scope, schedule, and cost baselines. An attached continuation sheet is acceptable.

19. Change Justification and Impact. Reason for change. Describe how the change will meet established requirements, increase capacity, reduce cost, or accelerate completion. Assess the impact to project safety, scope, schedules, and/or cost. If there is no impact, so state. For directed changes, specify the change authority and provide a copy of applicable documentation.

BCP Number. Same information as that provided in block number 1.

21. Impact on Cost Baseline. The approved cost baseline, the net change in the total estimated cost (TEC) and total project cost (TPC), and the proposed baseline. The baseline change control project log must be attached to the BCP.

	Baseline	*Change*	*Proposed Baseline*
Total Estimated Cost	$104,400,000	-$15,600,000	$ 88,800,000
Total Project Cost	$131,400,000	-$21,700,000	$109,700,000

22. Current Contingency. The approved baseline, the net change from the current contingency, and the proposed baseline.

23. Impact on Funding Profile. The funding profile from the last congressionally approved construction project data sheets, the net proposed change, the total of all approved changes since the last congressionally approved CPDS (referred to as annual changes), and the proposed funding profile in TEC/OPC funding (in millions of dollars) by fiscal year. Show the subtotal for each column and the total TPC for each funding profile.

	Approved CPDS		**Proposed Change**		**Annual Changes**		**Proposed Profile**	
	Capital	***Operating***	***Capital***	***Operating***	***Capital***	***Operating***	***Capital***	***Operating***
Prior Years	$16M	$4M	-$1.6M	-$2M	-$2M	-$1M	$12.4M	$1M
Current Year	$10M	$2M	-$0	-$0	-$0M	-$0M	$10M	$2M
Budget Year	$12.4M	$7M	-$2M	-$.5M	-$4M	-$1.2M	$6.4M	$5.3M
Budget Year +1	$19M	$2M	-$3M	-$.6M	-$4M	-$1M	$12M	$.4M
Budget Year +2	$24M	$8M	-$5M	-$1M	-$5M	-$2M	$14M	$5M
Budget Year +3	$36M	$9M	-$3M	-$1M	-$2M	-$1.1M	$31M	$6.9M
Budget Year +4	$6M	$1.3M	-$1M	-$1M	-$2M	-$0M	$3M	$.3M
Out Year(s)	$0M	$0M	-$0	-$0	-$0M	- $0M	$0	$0
Subtotal	***$123.4M***	***$33.3M***	***-$15.6M***	***-$6.1M***	***-$19M***	***-$6.3M***	***$88.8M***	***$20.9M***
Total (TPC)	**$156.7M**		**-$21.7M**		**-$25.3M**		**$109.7M**	

1. Include the sum of only those changes approved since the last congressionally approved CPDS to show the total impact (last two columns) on the CPDS. Note: To simplify calculation of the annual changes, subtract the funding profile of the latest CPDS from the funding profile of the approved baseline.

The total project cost of the “approved CPDS” plus the “annual changes” should equal the total project cost of the “approved baseline” in block 21.
In this example 156.7M + (25.3M) = $131.4M (refer to line 21 above).

In addition, the total project cost for the “proposed change” and the “proposed profile” should correspond to “change” and “proposed” totals in block 21 respectively.

24. Funding Source for TEC/OPC Increases. If the change impacts funding, identify potential funding sources. For example, identify the account, type of funds, and how funds may be obtained.

25. Impact on Schedule Baseline. List all controlled milestones identified in baseline documents (i.e., project plan or project management plan), that may be affected by the change. Show the baseline date, proposed date, and the net change. Dates should be given in terms of month/year.

Milestone	*Baseline*	*Proposed*	*Change*
Complete Procurement	3/92	8/92	+5 months
Complete Construction	9/92	2/93	+5 months

26. BCP Number. Same as block number 1.

27. Impact on Scope Baseline. List the technical baselines identified in the CDR, both functional and design, impacted by change proposal. Specify impact in quantifiable terms, such as square footage, flow rate, etc.

Item	*Baseline*	*Proposed*
Security	2,00 sq ft	1,500 sq ft
Waste Water	30 liters/min	35 liters/min

28. Other Impacts. Any other significant impacts, such as environment, safety or health, that should be considered.

29. Interim or Corrective Actions. Actions necessary to mitigate major problems or concerns until the change proposal is approved and implemented. An example would be the temporary closing of a facility to all personnel until safety improvements were completed.

Project Log

PROJECT TITLE	SUBPROJECT TITLE	BASELINE DOCUMENT	DATE
LINE ITEM NO.	SUBPROJECT NO.	TPC	TEC
LOG DATE:			

		DISPOSITION DATE / RESULT			BASELINE CHANGES				CON	REFERENCE: CPDS OR ADS				
BCP NO.	DESCRIPTION OF CHANGE	LEVEL 2	LEVEL 1	LEVEL 0	TPC	TEC	SCH	SCP		TPC	TEC	CON	FY	FN

DISPOSITION CODES:
AP - Approved CA - Conditionally Approved
DF - Deferred EN - Endorsed
RJ - Rejected AK - Acknowledged

DOE CURRENT APPROVED BASELINE

Footnotes:

Baseline Change Control Project Log: INSTRUCTIONS

Project Title. The project title found on the Construction Project Data Sheet (CPDS) or Activity Data Sheet (ADS).

Line Item No. The budget Line Item No. found on the CPDS or ADS.

Date. The date of the first entry is made to the log in the format of month/day/year.

Subproject Title. The subproject title found on the CPDS or ADS. If the line item has no subprojects, enter NONE.

Subproject No. The subproject number assigned. If the line item has no subprojects, enter NONE.

Baseline. The name of the approved baseline document from which the project baselines are obtained.

Baseline Document Date. The date the baseline document was approved.

Baseline TEC. The dollar value of the Total Estimated Cost (TEC) taken from the approved baseline document.

Baseline TPC. The dollar value of the Total Project Cost (TPC) taken from the approved baseline document.

BCP Number. The baseline change proposal number (assigned by the Operations Office), which includes a project designator in the number.

Description of Change. A short description of the change not to exceed two lines and written to fit into the space provided.

Date of BCC Board Decision. Determine the highest approval level based on the thresholds as defined in the project planning documentation. Based on the approval level, place "NR" in the blocks for which no board action is required. For example, if the BCP requires a Level 2 board, place an "NR" in the columns for Level 0 and 1.

When the required BCC board meeting is held, put the date in the upper half of the box in the format month/date/year.

After disposition by the chairperson, place the appropriate result code found at the bottom of the log in the lower half of the block. Codes are as follows.

"AP" Approved (can only be used by the highest level BCC board for the BCP).

"CA" Conditionally approved (this will require a footnote and an explanation at the bottom of the log).

"DF" Deferred (this will require a footnote and an explanation at the bottom of the log).

"EN" Endorsed (approved for submission to a higher level BCC board).

"RJ" Rejected (this will require a footnote and an explanation at the bottom of the log).

When a BCP is rejected and subsequently resubmitted, it should be entered on a new line using the same BCP number with a sequential revision letter to indicate a resubmission.

"AK" For acknowledged (impact of directed change recognized).

Baseline Changes. In the case of TPC or TEC, place the value of the change (not the resulting total of TPC and TEC) in the appropriate column.

To indicate schedule (SCH) or scope (SCP) changes, input “yes” or “no” in the appropriate column. To find out the exact changes in the schedule or scope, refer to the applicable BCP form.

Contingency. “Yes” if contingency will be used for the change and “no” if the change does not impact contingency.

Current Approved Baseline. The sum of the cost baseline given in the approved baseline document (shown at the top of this form) plus all approved BCPs. The CPDS is not the approved baseline, but it should reconcile with the baseline document and approved BCPs.

Reference: CPDS or ADS Fiscal Year (FY). This will be the current CPDS or ADS approved by Congress.

CPDS or ADS TPC. The numerical value of the Total Project Cost (TPC) taken from item 6 of the referenced CPDS or ADS.

CPDS or ADS TEC. The numerical value of the Total Estimated Cost (TEC) taken from item 6 of the referenced CPDS or ADS. This may be called TECC on some CPDS.

CPDS or ADS Contingency. The numerical value taken from item 10 of the referenced CPDS or ADS. If the line item consists of several subprojects, the contingency listed in item 10 will be the sum of all the individual subproject contingencies. In this case, the subproject contingency should be entered.

Footnotes (FN). Indicate in this column a lower case letter to indicate footnotes at the bottom of the log. A footnote is required to explain why a BCP is rejected or conditionally approved**.**